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Ten years' diggings in Lenape land, 1901



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TEN YEARS' DIGGINGS IN LENAPE LAND

1901—1911

BY
CHARLES CONRAD ABBOTT, M. D.

WITH TWENTY-TWO ILLUSTRATIONS
BY
ELISE GADDIS MOYER

TRENTON, N. J.:
MACCRELLISH & QUIGLEY, PRINTERS

1912

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PREFACE.

AS WELL tie a man's hands behind his back and tell him to defend himself as to expect an archæologist to do justice to his subject if he be limited by the exactions of Time.

Archæology cannot recognize this arbitrary method of tabulating sequence of event. It bears the relation to the proper work of the science that child's play does to man's serious endeavor. To the everyday affairs of life and to history it is indispensable, because custom has established it as an aid to memory, but it is the most artificial of all artificialization; yet, such stress is laid upon its importance that most men would be hopeless if they did not know the day of the week or time o' day.

It is, therefore, when we enter the archaeological field, like going from darkness into light, from a prison into freedom, from error into truth. Time here is a stranger in a strange land. It can make no demands but we may laugh at them. An archæologist is a free man. He has facts only as his companions, and his sole duty is to record their relationship. Ten or ten thousand are mere scribblings on a school-boy's slate, hieroglyphics for pedagogues to ponder over; but out in the open air, where, for problems, we have rocks and rivers, hills and dales, with sand, clay and gravel, instead of desks and black-boards, pens and text-books, the facts confront you and invite inspection, instead of bewildering suggestions, children of school-men and their predecessors, the hermit, monk and philosopher,

who knew nothing of the real world in which they lived, and in their ignorance defined life as skillful nursing of intellectual dyspepsia.

This good old earth, for good it is, although teeming with serious defects, never traveled along its orbit with a watch in its vest pocket. It never looked forward impatiently for the noon hour that it might stop its work, and never "struck" because some super-planetary influence was too exacting. Certain it is this has always been a busy world, and if it were possible to ask it, it could not tell you how old it was. It never took account of time in its infancy, and does not purpose to contract such a habit, now that it has had sufficient experience to know better.

It is not a matter of the slightest importance when an occurrence in Nature took place. Let us be sure that it did occur, and then determine its relationship to other events that are equally certain, but peremptorily shut up any chatterbox who pesters you with the supreme silliness of "how long ago did it happen?"

The fact that man existed on this continent when man was more savage than any examples of humanity in the experience of travelers, remote or modern, is sufficient. This basic fact is one upon which the archæologist may safely stand while in search of particulars. It is like the underlying rock upon which he rests while he examines in detail the overlying gravel.

Unfortunate as it is, it is an imperative necessity to be absolutely indifferent to public opinion. The archæologist must turn a deaf ear to every suggestion. To be logical, he must accept no second-hand fact, but face Nature and deal directly with her. His business it is to see what she has done in æons past, to interpret them to his own satisfaction, and never stop to consider if his conclusions agree with the general one of Prof. This, That or So. It is wise to ignore

them all for the time being and make yourself professor of each condition as you find it.

There is no more deadly influence exerted than the opinions of others. Gather your own from the fountainhead of thought, Nature, and when the sun sets and field-work is done, burn your midnight oil over the results. Then and then only compare them with the results of others. Time will sift the wheat from the chaff and tares and dirt and dust, and the really interested element of the public can enjoy the new additions to the common stock of knowledge. Of the phenomena of Nature generally the world is profoundly ignorant, and, what is worse, it is indifferent. A fact that pleases some one person mightily, when told to another too often calls forth only the chilling remark: "Well, what of it?"

It is no false position then to assume of ignoring all mankind save your precious self when facing Nature and seeking from her at least an outline of what the earth has been doing and what man has done in ages past. Nature will not shout above the babble of the crowd, so go alone that you may catch even the faintest whisper.

Facts are extremely complex affairs, and the "simple" fact of which we hear so much is non-existent. No object or incident is unrelated. There is no such thing as "a thing of itself." This table, at which I now sit and upon which I am now resting my arm, is not simply a table. That would indicate it had suddenly been derived from nothing, and was so much added matter to the common stock of it in the universe. The table is wood; it was once a tree, and one among thousands in a forest, and a man was instrumental in felling the tree, in shaping the trunk, and a vessel carried it across the sea and brought it to these United States, where it was skillfully shaped into a table, and passed on to a dealer in furniture, and all this happened a century and a

half ago. It has had five owners that I know of, and the first was a man of prominence, and yet we speak of a table as a simple fact. If what I have mentioned is simplicity, the world's prayer should be to be saved from complexity. All this true of indoor matters, what of the "simple" facts that we face when out of doors? What we there call simplicity is but the outcome of our own inability to grasp the significance of Nature even when she is apparently at rest and uncomplicated. Nature tests all our powers, and the eye or ear or nose alone fail to convey any correct idea. Seeing an object is not to comprehend it; hearing a sound is not realizing its source, and a pungent odor may have far more significance than we suppose. A pebble is but a fragment of a rock, but what of that rock, and where is it! The song of a bird is but a breaking of the silence, but what of the bird that uttered it? The nauseating stench of a skunk is an atmospheric catastrophe, but what of the animal; where is its home; what are its habits?

Even more so, if such be possible, is complexity the condition of all that has been affected by the mere presence or actual touch of a human being. Man stands alone among animals in this respect. He cannot make, but he can mar. He produces no desirable result so far as Nature is concerned. His tracks are ineffaceable. Unlike even the predatory mammals, he cannot dwell for any length of time without leaving behind him a permanent earth-scar. Where the mole upheaves the sod, flowers and new grass will flourish in the broken turf, but man leaves barrenness as the evidence of his one-time interference. This law is more and more apparent as man advances intellectually, and no one can overlook the evidence of his presence; but reaching backward, when man was more animal than intellectual, it requires a keener sight and a practiced hand to pick from the rubbish-heap of Nature's activities such bits as man was

instrumental in fashioning, or at least placing upon them the mark of his one-time ownership.

Such skill—if it will be acknowledged as such—can be acquired only after long practice, and no one will be as well satisfied with its outcome as its possessor. To pick up a battered pebble merely and say of it, “That is artificially abraded,” will not satisfy the ignorant audience to which the remark is addressed, so it follows that one phase of archæology which is meaning-full to the happy few is meaningless to the unfortunate many. But is this not true of every department of knowledge? The question arises if it is not well to pursue one’s studies oblivious to that chaotic mass, the public, and when the investigations in the field are completed, so far as one man in a lifetime can complete them, to give the results to this public and let it enlighten it or be ignored by it, as the case may be. If others, as years roll by, do as the writer has done, and arrive at the same conclusions, the probabilities are that labor has been expended in the right direction, and a modicum of truth added to the world’s common stock of knowledge.

It is impracticable to set forth on a printed page the actuality of a day’s digging. There are conditions that defy the camera, on the one hand, and defy the descriptive power of the archæologist on the other, yet they are none the less real. To the curator, thinking only of filling a museum case, or that pest, the amateur collector, thinking of a rare specimen, these conditions are unknown, but to the enthusiast who desires solely an accurate, though it be a very transient, glimpse of what has been, they are more real than the crania that he lifts from the earth or the scattered relics that he sifts from the sands of one-time village sites.

Digging is too suggestive of rough and tumble disturbance to be in any sense a scientific operation. The spade

merely moves, but never in a discriminating way. It crashes through a pot as remorselessly as it does through turf or a stratum of clay; so it is necessary, if real examination is one's purpose, to handle the earth as daintily as a fragile shell. Not every evidence of man in a sand bank is as big as a barn-door. The tiniest potsherd is as eloquent of ceramic art as the grand gallery in the museum at Sèvres. The archæologist afield needs all the aid that he can command to both eye and hand that he may gather up the fragments that remain, that nothing be lost. Such slight traces of man's presence in ages past do not mean anything, or very little, when consigned to a museum case. They are too small to be intelligible when but objects in themselves, but as meaning-full where found as are the punctuating dots and dashes of a printed page, affecting the entire meaning of the words, but which detached are simply dots and dashes. Here, then, even a camera cannot help us, and there is but one avenue open to us that leads to logical conclusion, the scientific use of the imagination. From such scanty traces that are traces no longer if removed, there is a possibility of reconstruction of past conditions. A footprint is as much evidence of man as if he was still standing in his tracks. But when all the care has been exercised that the occasion calls for, and the facts set down in orderly array, they have no value in the minds of unsympathetic readers. Words, to the masses, are nothing but words, and even when objects are offered, they are preposterous in their demands. One bone is never enough; they demand a skeleton.

Such pessimistic attitude is not discouraging, and it should strengthen the independence of the individual who essays to dig for himself. Ignorance has produced and fanaticism preserved the most dreary and useless of all tomes, and archæology is a close second. It is not a matter

for literary exploitation so much as continued operation with the spade. The tendency has been to theorize over a half-day hole. Only a few more spade-fulls of dirt tossed out and the truth would be made plain. One tiny chip of stone deep in an ancient sand-bed is worth all the beautiful arrowpoints that are daily manufactured in the valley of the Columbia river. But such a chip must be equal to the task of rousing the imagination to its rightful work. The chip must go back to the rock from which it came, and come forward to the hand of the man who detached it from a larger mass that a shapely weapon might come into being. The man must stand forth boldly when his handiwork is seen, or in what does a chip differ from the grains of sand or the pebbles that surround it? The object finished, weapon or implement must lead to its purpose or why was it fashioned? There must start an unfolding that defies language, but not the mind, until the whole story of the distant past is told. Simple as is this story to the favored few, it is heard with a pitying smile, if not a damning sneer, and it is an even chance if one is more irritating than another. Most of us have been so long salted in falsehood that no freshening process is possible. This is peculiarly true of archaeology. Who has not had to unlearn the fact, as it was claimed to be, that some six thousand years encompassed earth's career? Antiquity is an ugly word as it falls on ordinary ears, and unintelligible is so true a statement as that the dawn of humanity broke one Miocene morning; but it did.

It has been asked by those who should know better that the archaeologist afield photograph his way through a sand-bank, and, letting pictures tell their own story, keep his mouth shut, but there are facts that elude the camera. A general condition cannot be transferred to the plate as it can to the retina. An eye has greater penetrative power

than a lens, and yet it has been suggested that a lens' story is all that is needed. A lens can, however, misinterpret as well as the eye. The sketch of an artist emphasizing certain features is telling the truth in a more effective way than when the lens reduces all to the same level, and the prime importance of one feature is lost in its reduction to a level with features of no importance.

Uearthing tangible objects, skulls, axes, pots and trinkets, arouses interest akin to excitement; but, after all, what of them? The same skull has been perched on very different shoulders by the craniologist, as the occasion required, instead of allowing it to remain where it belonged, with the skeleton of an eye-witness to glacial activity. Weapons and homely artifacts tell their own story as the rabble shouts its determination: cheap noise; but the broken stone or battered pebble or trifling chip that the trowel brings to light holds the real secret, which, known, fulfills the purpose of archeology.

Even our grandfathers remember seeing Indians hereabout, and it was these redmen's grandfathers that made the relics that we now gather from the fields; but as the European colonist succeeded the Indians, whom did the Indians succeed? And, too, if he had a predecessor, what of him? When was this beautiful valley of the Delaware a veritable *terra incognita* to all mankind?

Since 1877-78, when I announced in most unequivocal terms that man's antiquity had been demonstrated by discoveries that associated him with at least the closing activities of the glacial period last occurring and, inferentially, that he dwelt here previous to this physico-climatic condition; that man witnessed the retirement of the glacier from the valley of the Delaware and was familiar with an arctic fauna that roamed through the land and disported in the icy waters of the river, the mastodon, elephant, caribou,

musk-ox, walrus and seal—since then there has been, at times, an outburst of criticism that was characterized by anything but a calm questioning of the evidence as originally set forth. To the writer hereof, at whom it was aimed, it was amusing at first, but soon became tiresome and I ignored it. The facts, which were and are public, not private, property, could not be affected by comments upon them and, as I had dealt only with these facts, my rest was not disturbed.

The source of all criticism should be closely scrutinized. More wonderful discoveries would then be made than the chance occurrence of a palæolithic artifact in a bed of gravel. It would seem as if, in this instance, that it had been pre-arranged by ultra-conservative geologists that the question of man's initial appearance on the North American continent must be determined by them, and not by digging in the earth's upper crust but in the depths of their ignorance and finally deciding at some annual junketing by vote or unanimous acclamation. At least, the question appears to have been looked upon, if not yet, in some such matter.

Certainly no geological condition which is comparatively free of complications has been so misrepresented by some geologists in their reports upon it, and most remarkable is the fact that the violent outbursts of protest as to evidences of man's antiquity here have come from those who have never visited the locality. Indeed, the main purpose of an official report on the surface geology of the State seems to have been written with a predetermined design to demonstrate the impossibility of man's occupancy of the region prior to a few centuries ago. The evidence of man's presence in pre-Columbian time found upon the surface goes unquestioned, but this same evidence—undeniably the same—if occurring at a significant depth, becomes *lusus naturæ*. In short, man must be studied not as an animal but some-

thing separate and apart from other products of evolution, and the ordinary procedure of palaeontological investigation does not apply to him; at least, not to him as an inhabitant of the valley of the Delaware river.

The archæological student, presumably, when engaged upon his subject, reads to be instructed; but, so far as the valley of the Delaware is concerned, he must read the vituperative critics of antiquity only to be amused. If taken seriously, he will be led completely astray. Totally disregarding the truth, but determining to be sensational and secure the attention of the uninstructed crowd, only the "yellow journal" methods have been used. The result is this so-called archæological literature is much more of a curiosity than artifacts in ancient river sands or in the debacular debris of a retreating glacier. Had it had a deterrent effect, Volk's twenty years of fruitful labors would not now be illuminating a region where darkness had prevailed, a darkness in which the non-resident archæologists delighted to revel, because, apparently, not their fortune to make discoveries of equally far-reaching significance.

It is on record in more than one scientific journal that occasionally an over-bold student has timidly whispered a suggestion concerning antiquity, but forthwith was he effectually snubbed. "Official" science, claiming its word was law, would have none of it. The case was one to remain forever on the calendar, but never to come up before it. Smug content to allow Europe to have all the plums in the pudding, at once, soothed its complacency and seared its conscience. Such a status could not be permanently maintained. It behooved non-official science to assert itself, and, taking up the burden of investigation, demonstrable truths were wrested from the reluctant grasp of Mother Earth. Rebellion is sometimes wise, but the risks are tremendous. Here is an instance where victory crowned its

efforts, but the vanquished are yet unable to realize that they are defeated. Ineffectual murmurs still are heard in academic halls.

An interesting question comes to the fore when we realize that we have a fairly complete series of traditions concerning the Lenâpèan career during centuries of continental wanderings, and ought not these to render it unnecessary to exploit inferential history derived from the study of Lenâpèan relics that time has spared?

'The weakness of tradition lies in its susceptibility to interpretations widely different or diametrically opposed. The hero actually lived or is a sun-myth and the advocates of each view are equally strongly entrenched behind a bewildering array of arguments. Tradition, too, is usually so vague that its original purport is left to conjecture. The great battles of a people's ancient history as handed down from generation to generation may have been a trivial combat as to numbers, but of far-reaching effect as its result. Hence it is remembered. A river, swollen by unusual rain, becomes an inland sea, and never a tale told of seeing something strange that it did not reach to wild extravagance and become a fairy tale before it was forgotten. He who was more skillful at any craft than his fellows became a god before he became a grandfather. Yet, with all this against it, tradition has the ring of truth when read aright, and he who would know something of the Delaware Indians must read carefully Brinton's "Lenâpè and Their Legends."

On the other hand, there are unquestionable facts that we cannot overlook, and such are the conditions under which their imperishable relics occur.

A stone implement or a clay vessel cannot misrepresent itself. We may ignore its significance and misrepresent it to others, but what it is, it is, and no sophistries or ignorance on our part can make aught else of it. The difficulty lies in realizing its purport. To do this requires a training.

very different from that of the mere collector, whose aim is to appeal to the eye rather than to the understanding.

Tradition is not tangible. Even when recorded and so made secure for all time to come, it is still tradition. Its origin is never discoverable, however closely we may scan the text. It bears such relation to it as an echo bears to sound. At best, we can only say of it, it had a basis of truth in the indefinite long ago.

This is not true of the artifact that ancient man has left behind him. It passes directly back to the hand of the man who made it. There is no intervening period of doubt, forgetfulness or wilful misrepresentation.

We have only to consider our own history or what goes by that name. It bears the relation that darkness bears to light. If any peoples' real history was wholly known, that people would disappear, consumed in the fires of its own confusion. The aboriginal historians were, doubtless, equally discreet. They told a plausible tale, one that was pleasing and tickled tribal vanity. The victories were exalted to the highest pitch; the defeats ignored completely. No cowards figure large in tradition, but this does not prove that none existed.

Nothing of all this uncertainty confronts us when we unearth the relics remaining where once a wigwam stood, or the plough brings to light what remains of a one-time village site. It matters not what tradition has to say, here is evidence that cannot be explained away. If it denies what the relics assert, then it is plain how far we are warranted in relying upon it.

If in their wanderings the Lenâpè reached the valley of the Delaware and finally settled here, making it their "home," as they thought, for all time to come, and this only some five hundred years ago, then all traces remaining of this occupancy must be explained as the output of their industry during that period. But what if these implements,

weapons and ornaments, to speak humanly, rebel? What if they assert of themselves and substantiate their claim by their surroundings, that they were old and forgotten before the dawn of the first of those five centuries? Is it reasonable to tell them to "lie low and keep quiet," or, as a Chicago professor of geology recommended to his students, if they ever, by chance, discovered traces of man's antiquity, to re-cover it. If the Lenâpè had embodied in their tradition that Scheyichbi was populated with a ruder people when they reached that land and no trace of such earlier occupation was now discoverable, then we would hesitate to accept so much of that tradition; but it happens there are abundant evidences of such earlier occupation, and must we reject them because tradition is silent?

Tradition has its value, but tangible evidence, innocent of all the weakness of uncertain man, is not to be passed by. Much truth can assert itself without man's agency. A terminal moraine tells a truer story of a glacier than the average tourist from Alaska or the Alps.

It is the province of the archæologist to reconstruct the past by the aid of such vestiges of it as remain. Tradition may help at times, but the chances are that it will prove a hindrance, for facts may become so diluted in this tradition that their one-time actuality becomes inferential only and no longer demonstrable.

As upon other occasions, it is incumbent upon me to express my gratitude for the indispensable assistance rendered by M. Taylor Pyne, Esq., of Princeton, N. J. But for this it would have been impossible to pursue those explorations which have yielded facts which I have endeavored to set forth in the following pages.

CHARLES CONRAD ABBOTT, M.D.

Three Beeches:

Trenton, New Jersey,
March 4th, 1912.

CHAPTER I.

LENÂPÈ LAND.

INDETERMINABLY long ago, and therefore in that period of the earth's career which we call pre-historic, a restless, roving people, skilled in many crafts, yet not pre-eminent in any, reached what proved their *ultima Thule* when they stood on the bank of the Delaware river and facing the forest on its eastern shore, could do no more than thread its maze and find an ocean confronting them.

Many a broad expanse between mountain ranges and shores of many a lake had been theirs, but nowhere did they make the land permanently their own and rest content to there develop it and themselves. A spirit of adventure—or was it the result of disastrous wars?—led to change of base time and again, until they reached, or a part of their people had reached, the territory that was to them, until ousted by the European colonists, Lenâpè Land.

It is not impossible to picture this region, particularly the eastern shore of the river from the limit of its tidal flow to the ocean and from the present Sandy Hook to Cape May, when the Lenni Lenâpè took possession. European colonization, later, was too slow at its inception to destroy all landmarks, and the river in front of it rather than the forest behind it occupied its attention. Farms extended landward only as the population increased, and these were in the creek-valleys, for the water-way was then more of a desideratum than the winding bridle-paths, which had been Indian trails in other days. So it was that vast tracts of forest remained for many years as the Indian had left them. Road-making *de nova* and the widening of

ancient paths for wagon traffic came later, and with it the gradual "improvement" of the country, a glorious wilderness converted to prosaic fields. The Indian names were retained for some small streams, but so barbarously are they mispronounced that no Indian now would recognize them.

Among the earliest colonists the Indian was not an object of interest so much as of suspicion, and the golden opportunity was lost to preserve a real history of their career as they then remembered it, and their personal belongings were regarded with pity because so inferior to those the colonist then had in use. If preserved at all, it was to give them as playthings to the children, and the result was, precious relics, as they would be now, were destroyed. It is true, somewhat later, Kalm, Loskiel and Heckewelder did something to rescue the race from oblivion, but how little does it amount to. To be told that an axe was used to fell trees and an arrowhead was the armature of an arrow-shaft might as well have been left unsaid.

Yet, in spite of all this discouragement facing the archæologist at the outset, there is no reason for despair. Lost is not always lost, or gone, gone forever. Some traces of man are imperishable, and let them speak for themselves. Before they do so let us further consider where these traces are.

The Lenâpè Land was no low-lying, level plain, with an imperceptible slope to the ocean. It rose in many places sufficiently high above the sea to afford commanding outlooks, and there where inland streams had worked their way there were valleys, deep and wide and so densely wooded that the skill of a savage might have been overtaxed to thread them. There were wide meadows with their treacherous quicksands and dry, sandy knolls—ancient sand dunes—with sparse growth of stunted trees. If

variety was a necessity, there was sufficient for all needs, and such variation of conditions is a necessity if its human population would genuinely succeed in the struggle of existence, for it is this variation that produces a wide range of food, both animal and vegetal, and no race has proved an unqualified success that was limited to one or the other diet.

A varied flora and fauna, characterized by a wide range of life-forms, conduces to mental activity. Variety is the food of thought. A monotonous region reduces thought vibrations to a monotone. A healthy growth is only coincident with intricacy of its dependence, and these ideal conditions obtained when the southern half of New Jersey was something more than a coastal plain, which it had been long enough to be a great deal more when the narrow, rock-ribbed valley of the upper Delaware was choked with ice throughout the year and throughout undetermined centuries. It extended, too, far eastward of its present boundary. The ocean has done much for us, but a vast deal against us. It means a good deal to be robbed of many square miles of habitable country.

There was no monotony in South Jersey during the Pleistocene period. It means a good deal when the mammoth is rambling about, when the giant deer was abroad, and cougars, bears, Virginia deer, caribou, and a long list of smaller mammals found a safe foothold and flourished as they have never done since. Then, the bird-life was at the climax of its glory. The water courses and the sea-coast were crowded with fowl, the forest with birds of the wood, and every glade merry with the songs of thrushes, finches and warblers. The forest was not one vast expanse of gloomy pines, but many the square miles covered with deciduous trees, oak, hickory, chestnut, walnut, beech, birch, elm, locust, catalpa, tupelo, liquidambar, tulip, sycamore,

sassafras, maple, willow, horn-beam, ash—trees available for every purpose desired by man. The shrubbery was abundant, luxurious and varied, and what is of much importance, fruit-bearing. Whatever the life-form, it had food in abundance. Then, too, the climate is to be considered, for there is no more important factor. The round of the seasons in these remote prehistoric times, while the northern half of the state was still glaciated, was so favorable to other life as it now exists, that man, living close to Nature, could have had no reason to complain. It was that happy medium between our present climatic extremes wherein man only can reach a high estate. Frost is the only safe stimulant named in Nature's pharmacopœia—all others are poisons. That the climate has changed since European influx is scarcely open to doubt. No country can be deforested as New Jersey has been without affecting climatic conditions. Our rainfall may not have varied as to quantity, but there is now a tending towards a wet and dry season. Many of our smaller streams practically disappear for weeks, and the river, above tide-water, "runs nearly dry" and then suddenly overflows its banks to such an extent that disaster results. The earliest people to reach this region knew nothing of such erratic methods on Nature's part. The dense forests prevented it. It is true, later, the Lenâpè had a word for freshet, "mechaquiechen," but it referred to the swelling of streams when the snow melted at the end of winter. Years ago we were said not to have any climate, but only samples of weather. This was not true some thousands of years ago. Its substitute, our present weather, is, as least to great extent, the outcome of that recklessness of the European colonist, who considered the world but a stepping-stone for himself to something better. Reckless destruction for present gain must lead to disaster sooner or later.

Lenâpè Land was fortunately conditioned in Pleistocene times and later, for though cool in winter and warm in summer, both extremes were tempered and little so delicate that to it the transition from one to the other proved fatal. It mattered not that ice filled the distant valley, that snow and rain and fogs were persistent there, for the ocean's atmosphere tempered it all when it reached the coastal plain and that wide expanse of forest-clad, rolling land twixt the river and the sea.

The observer does not need to be a geologist in the scholastic sense to read the simpler records of the past, if he walks with his eyes really open. He need not go back to the rocky hearts of mountains to get an adequate idea of his immediate surroundings. What is required is an unbiased view of available facts, and so equipped he is not likely to go astray. When associated and varied as the contents of a schoolboy's pocket, it is not an evidence of scientific skill to dissociate objects and determine their respective places in the past and present. As we know that the tiniest oak is older than the last crop of acorns, so we can pronounce judgment on the place in history an object occupies. So it is that in the present we can read the immediate past and in the pages of it still preserved, read back yet another chapter. It is true it is not pleasing reading. As we approach the past we draw near a pleasant condition, and reading nearer to our own time we draw away from it. Lenâpè Land was a land of plenty and of pleasure in those Pleistocene days before human history began recording some of those embellishments that it would gladly have forgotten. And as the centuries rolled by and the glacial ice finally disappeared from the valley of the river and the seasons were established more as at present, and the fauna changed only to the extent of some mammalian life retiring northward, the land remaining still inviting, and this was

its condition when the "historic" Indian in prehistoric days first sighted it, first stood on the shore of the river that he then and there called his own, and soon after, for the first time, watched, with astonished gaze, the resistless waves of the sea breaking upon the strand.

When did this happen, and who were these people? If we look through the literature of the subject, the initial impression is that in proportion to ignorance was the eagerness to make reply, and after a perusal of twenty titles the reader is left precisely where he stood when the first of the series was opened at page one. Not that this literature has no value. Even Boudinot's "Star in the West" has an item here and there that is worth remembering; so it is not a star of such diminished magnitude it is wholly lost to sight.

There is nothing to guide us as to when the Lenni Lenâpè made the present New Jersey their own land, or whether they went forward to possess it as discoverers or conquerers. That is a question for later discussion; but, however it happened, come they did, but when? Of man it may be said that he is the only mammal that leaves behind him imperishable traces other than his bones. Unfortunately, these do not lead to conviction as much as contention and need not be considered at present. Man, too, is the only mammal that is not sufficient unto himself, trusting neither to his head nor hands nor heels, but requires a weapon. Immeasurably as his intellectual power was beyond that of the mammals with which he was associated, this alone was not sufficient until it led to the invention of a weapon, which, in fact, was not the birth of a unique idea, but an evolution of the effectiveness of a stick in the hand of an ape-like forbear.

The rude weapons of the Lenâpè were far advanced over the implements of offense and defense of their remote an-

cestors. They varied to meet varied conditions, and from the weapon came the economic artifact, the agricultural tool, the hunting and fishing devices and the innocent but no less treasured personal adornment, as the naturally perforated pebble and then the elaborate bead.

It would be interesting to know how well equipped were the Lenâpè when they reached the valley of the Delaware. Certainly, if they came directly from some distant point, then they must necessarily have brought with them the characteristic products of that region. If, on the other hand, their progress was extremely gradual, then the artifacts made as they approached the East would be similar in pattern to what they had been accustomed, though the material might change, one available rock not occurring where they then were, but which was a characteristic one where they had been dwelling. If, again, the country materially differed from time to time as the migratory movement continued, this would rouse the inventive faculties and new forms would be brought into use to meet the new conditions. Suffice it to state that the relics now found in Lenâpè Land are Lenâpè relics and, while strongly resembling those of the middle western States, yet they are not quite the same. Some of the most marked objects of, say, the mound-builders' area are wanting and often their substitutes are but crude makeshifts in comparison. On the other hand, the flint-work, at its best, is of marked excellence and compares favorably with that of other parts of the continent. Of course much depends on the material at hand. The jasper and pure quartz in the river valley are not as easily worked as some forms of silicious stone found elsewhere, but the difficulties had been overcome and the results obtained is a marvel of skill in the flint-chipping art.

Of first importance in the consideration of the relics of a people as a guide to the point in time when their presence

began and for how long a time it continued, is the condition of the territory as a whole. If the physical geography is such that the surface is fixed, or comparatively so, and the impenetrable rock or clay so near the surface that gradual inhumation of objects is impracticable, then there is no means of determining the relative age of objects found intermingled upon this surface or very near it. Some may be, probably are, immeasurably older than others, yet more conspicuously an object of the surface than many a smaller and more specialized form. If a thousand years had rolled by, there would seem, judging from our standard, that a decided improvement must have come about in the fabrication of implements, but not necessarily. The grooved stone axe, which is a naturally formed pebble with edge and groove added, is so far simple, yet complete, that improvement is not to be looked for and no material modification occurred. How old, the oldest axe, cannot be determined, but it is significant that they are not a feature of the "deep finds" and extremely seldom a part of the grave contents of an Indian, however shallow and recent, yet they were still an object in universal use when Penn treated with the Lenâpè under the outspreading branches of the elm at Shackamaxon. Yet axes are old; so old that the implement was known to those people before they came as far east as New Jersey. They are very new as compared with many another form, yet very old as things of themselves, if conditions under which they occur is a criterion. To say of any object that it is not old because it is what it is, but if anything else would, of course, be as old as the circumstances of discovery indicated, is in line with the determined opponents of antiquity, and as such the reader is advised to ignore it. Those students of archæology in North America whose sole purpose is to modernize *Homo Americanus* bear the relation to honest investigation that a humming mosquito does to the patient angler.

In Lenâpè Land, as it is here defined and limited, the conditions are all favorable for receiving and retaining, without confusion, the records of man's presence as chance filed them away in the sands and soils of the plains and valleys. Such being true, the evidence of age, comparative and actual; advance in skill of fabrication and of inventive activity should still be traceable where the invasion of the landmark-effacing people of the present, has not reached. Such is the case, and yet the Lenâpè were as much a people of the present flora and fauna as ourselves. The forests of their day are the forests of ours, save the difference in extent. They were acquainted with the same lesser flora and there is no evidence since their reaching this region that one plant has become extinct or any new form come into existence. One or more changes may have occurred with reference to the fauna, as the evidence strongly points to the conclusion that the elephant, mastodon, peccary and giant beaver were known to them, yet extinct in this region when the Lenâpè were first known to us. All this demonstrates how slowly Nature moves in at least some parts of the world. Lenâpè Land has not been a cataclysmic region since the dawn of humanity in mid-Tertiary time. It may have dipped down into the ocean and come up again, but never worse for its bath, the performance being so gradual that its pre- and post-aquatic conditions were much the same. It is a curious condition and apparently a contradictory one that sand is at once so unstable and yet so fixed a formation. If not violently disturbed it is as tenacious as rock and holds with as tight a grip any intrusive object as the rock guards the fossil that has formed within it. When at some prolonged period of rest, it is protected by the vegetation that warmth and moisture quicken into life, the sandy soil remains unchanged throughout the lapse of centuries. Transient vegetation will sooner or later give

place to tree growth and the roots will penetrate it to some extent, but usually spread out an intertwining network that acts as an effective support. Objects that were embedded in sand when that containing bed was the exposed surface are not likely to be disturbed. The bugbear of a root-hole need not disturb even the dreams of an archaeologist. They only disturb the objecting geologist who never saw the empty space once occupied by a tap-root. Even sandy soils are not like a jawbone with holes where the roots of teeth have been. An overturned tree does not, in falling, pull out such penetrating roots, but breaks them off, and they slowly decay and the sand at the sides gradually fills up the space once occupied by living vegetation. There is no chance for an artifact to take an inconsiderate dive into greater depths, that its subsequent discovery may put him who finds it on a wrong scent.

The effect of deforesting is not very marked when the stumps of the fallen trees remain, but when these have decayed and the ground has nothing to protect it but grass and weeds, then rain has in time an eroding effect which must be considered very carefully, for when the sod is broken, water accumulates and then finds an outlet and a change has commenced that in a few centuries will effect a complete alteration. In sandy soils, unless the herbage interferes, the wind will steadily erode during the dry weather, thus continuing the work of the rainfall. Fields with scarcely appreciable slopes have, even in a century, become deeply gullied. Traces of early man in such areas must necessarily be displaced.

During the Lenâpè occupation no deforesting was general. The small areas cleared for village sites and for cultivation were not sufficient to affect the country as a whole, and forest fires, however extensive, did not alter the contour of the area burned, as the fallen trees, ashes and

débris generally was an effective covering, and when decayed but added to the soil that sustained vegetation as before. If the humus was destroyed and a barren resulted, it was so surrounded by forest that it did not alter as does the sand immediately back from the ocean, where dunes are made and unmade as readily as the political conditions of an ungoverned country. As a whole, then, Lenâpè Land, though sand, was stable; but still Nature's operations were not staid. The valleys widened and deepened, trees were uprooted by tornadoes and undermined by water, and when all these occurrences are considered, it is wonderful that the traces of the Lenâpè are confined so exclusively to the present surface. We find them in ploughed fields. No systematic search is really necessary, but we must dig to determine what the Lenâpè really was. As scattered relics, his handiwork has little suggestiveness beyond that of use suggested by the pattern. An axe and a hoe, a spear and a pipe, are easily distinguished, but there is a blending of one form into another that puzzles us and light is thrown upon them only—and not always then—when we find these objects where the Indian left them, associated with other forms. The associated objects of a village site are more suggestive than single objects scattered over acres of ploughed ground. But under the most favorable circumstances of discovery, much is still left to conjecture.

A variety of implements imply varied occupation, and Lenâpè Land shows the possibility of such occupations. These may be divided into hunting, fishing and agriculture. War is not included, as it is a question if this was not an occasional occurrence wherein hunting implements were put to uses of offense and defense. The tomahawk was not likely to have been fashioned solely for cracking skulls, but was used far more as is our hatchet to-day. Long, slender, sharply-pointed blades that we call spear-heads.

were as effective for thrusting into bears and cougars as into human foes. To be always ready for a fight is not to be always fighting, and the Lenâpè have been called a mild-mannered people, which is probably correct, but upon what authority the statement has been made I do not know. War, if continuous, would have depopulated in time, and the Lenâpè were a numerous people when at the height of their prosperity. A word as to what would constitute a "prosperous" condition. It calls for a fixed population of sufficient numbers to create a demand for a wide range of objects and specialization of activities. A few bands of restless warriors¹ would never have needed what we find among their artifacts, preserved until now. The enormous number of their simpler implements, if the property of but a few individuals, indicates a prolonged period during which the land was in the Indians' possession, or, if not that, then the population was large, that, for a shorter period, required stone axes by the thousands and arrow-points by the hundreds of thousands.

So varied are the stone artifacts—and there were thousands of wood and bone which have not been preserved—that no one individual could have needed one of each pattern, nor could any one man among them have proved equal to fashioning these varied patterns. Everything points to a certain amount of specialization of occupation. It is not to be supposed that the able-bodied men only carried spear and tomahawk about and when not on the war-path were idle. This means that the women did all the work, even to making the tools they needed. They did do more than their share of household drudgery, but not everything that was absolutely needed. These varied possessions tell another story. The warrior may have delighted to load his person

¹ The Lenâpè and their Legends, p. 41. D. G. Brinton, Philadelphia, 1885.

with ornaments and carry a pipe that had been skillfully carved, but were these the output of his own or his squaw's industry? Far more likely there were artificers who were skilled in but a single product. So, at least, I am inclined to believe after gathering many thousands of their implements, weapons and ornaments. They suggest collectively a wide range of interests and not merely war or hunting. We should pay less attention to what people say of other people and more to what these people say of themselves through the proofs of their industry that have been preserved. Few are the evidences that objects were brought here during any migratory movement, and some forms characteristic of more western regions once occupied by these same people are here in New Jersey absolutely unknown. As it was, Lenâpè Land supplied the materials, save two or three, of which all their possessions were made, and foreign material can safely be referred to inter-tribal commerce and communication that was established after the Lenni Lenâpè were finally established where the Swedes and Dutch and later the English found them. Catlinite and obsidian and some shells from distant seacoasts are examples. A survey of the whole field suggests, I maintain, a prolonged occupancy and a considerable population, for aboriginal artifacts are still countless and do not all occur under like conditions. So innumerable are potsherds that if the vessels of which they were parts could be reconstructed we should view them with astonishment. Nor are these potsherds uniform in character. They vary from mud that has been but lightly fired to tough ware that approaches vitrification. It may be going too far to claim that manipulation of clay-earths began here, but it certainly did improve when the industry was established, and it is somewhat significant that Lenâpèan pottery of the Delaware valley is readily distinguished from that of other regions. If not

artistic, on the one hand, it was, on the other, not crude, and the attempts at decoration were often very pleasing arrangements of lines, dots and small circles, and a near approach to the Greek fret has been found. While utility predominated, evidences are at hand to show that among them were skillful potters; and while no artistic vessels have been preserved, at least one object of pure art has escaped destruction.

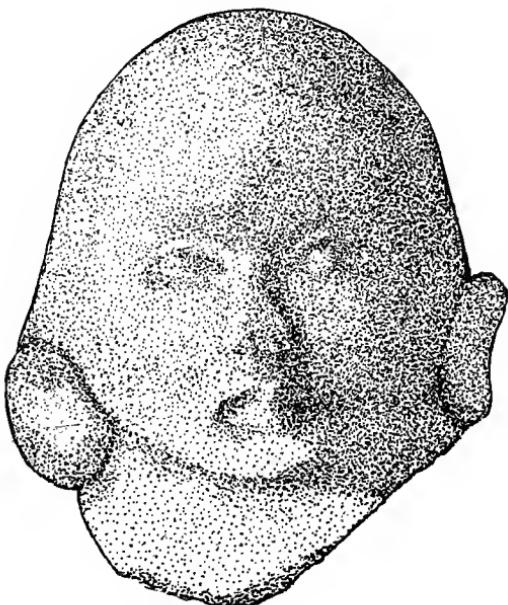


Figure 1.—American Sphinx. Terra-cotta head, by a Lenâpèan artist.

For a unique object that called for a name, I adopted that of "Sphinx" as highly appropriate. Found on an Indian village site, associated with many objects of rare excellence of manufacture, it stood so separate and apart from all else, was so un-Indian and so truly artistic, that it called 'for study from other than the archaeological point of view. Withholding all expression of opinion save that it is un-

questionably the handiwork of an unusually gifted Lenâpè man, I quote herewith the results of its examination and study of the scholar to whom it was intrusted.¹

"The head is a sketch, and is modelled with the same technique employed by the practiced sculptor of every period.

"The suggestion that has been made that it was pressed in a mould is untenable, as may readily be seen from a side view.

"The re-entrant curve of the top of the head being such that it would be impossible to withdraw it from a mould.

"It is not modelled by pinching up the clay, as were many of the cruder images found among prehistoric objects, but by sweeping strokes of the thumb or finger following the contours of the face.

"This, upon a close inspection, is evident from the fine lines following the contours, which were caused by grains of sand dragging under the thumb or finger of the modeller.

"That it is not a fragment of a bust or figure, or made for an ornament to be applied to pottery, is proved by the rounded and smoothed edges of the irregular back.

"By reason of its irregularities it would not even approach fitting to any plane or rounded object, and the smooth finish of these irregularities, not from design, but as they became rounded by contact of the fingers during the manipulation of the clay, preclude the idea of its being a fragment.

"The ear ornaments are, of course, mere flattened pellets of clay pressed upon the sketch at completion, probably as an afterthought, giving the final touch of character of the man the modeller remembered.

"The head is unsymmetrical, but not in character, the

¹ Evarts Tracy: Letter to author.

right side is flatter, the beautiful modelling is not carried as far as on the left, and there is an excess of clay on the lower right-hand side.

"This is due to the natural fact that the modeller held the clay in his left hand, using the lower prolongations as a handle, and naturally the most finished work was done where his more skillful hand worked to the best advantage.

"If one who had the artistic ability to do the wonderful work shown on the left side of the face had desired to make a finished object, it is inconceivable that he should not have brought the other side to the same state of finish.

"If one states it may then be considered an unfinished object, the answer lies in the ear ornaments, applied over this less developed side, as the final touch, showing the work had gone as far as its author intended to carry it.

"Considering it, then, for what it indubitably is, a sketch, one asks what circumstances led to its making.

"I consider it an illustration made to bring before the minds of his companions the image of one the other had seen, more vividly than he was able to do by verbal description.

"Sight preceded language; the eye is ever more accurate than the ear, and the artist best translates his impressions through the medium most familiar to him.

"It is a memory visualized for the benefit of those who had not seen an individual or race like to it."

In an earlier communication Mr. Tracy gives an impression of its origin in greater detail, which may well be put upon permanent record, as there seems to be no flaw in his argument. He writes:

"It is a true work of art, but it cannot be the idealistic fancy of a New Jersey Indian, historic or prehistoric, unless in prehistoric days someone wandered down to that locality by way of Bering Straits, or its creator had traveled north-

ward until he looked on the face of some Oriental wanderer. The creator of that head had seen a living face having its characteristics.

"No race, however imaginative and creative, has developed a human type from introspection. The history of art and its examples from the earliest periods show that it was always their own race which they drew or modelled. When imagination inspired them toward higher ideals they idealized their own type; when their mood was pure fancy their grotesques echoed the knowledge of the faces surrounding them.

"Grant that a New Jersey Indian of consummate skill as a craftsman could in his moments of fancy create one feature approximating racial characteristics he had never seen, he could never complete a racial type in every feature so perfect as this head.

"The lofty and broad forehead, the full eye, the shape and character of the lids, and, above all, the full and gently rounded shape of the outer brow, not to speak of the indications of the nose and the full development of the lips, are to me, at least, a proof of Oriental inspiration. It is almost a Buddha head; it has the wonderful calmness of a philosopher whose thoughts have risen far beyond those of the inhabitants of the land where it was found.

"You tell me that the Indians travelled far north of this region until they met and held traffic with the Eskimos, who undoubtedly were of Asiatic origin and in communication with Asia¹ by way of Bering Straits. Why is it not possible and likely that this sculptor had made this northern journey and met an Asiatic wanderer who came down with his northern friends to the meeting place? If so, with the wonderful Indian memory, what more likely than that on

¹ Probably only in remotely prehistoric time; but pottery is imperishable. C. C. A.

his return he described among his adventures the man with the strange face and, artist that he was, graphically illustrated that description with the clay."

That individual Indians were sometimes far travelled is attested by Du Pratz (*History of Louisiana*), and what is of equal pertinence, types of implements distinctly Eskimo occur on our seacoast in the oldest shell heaps and to less

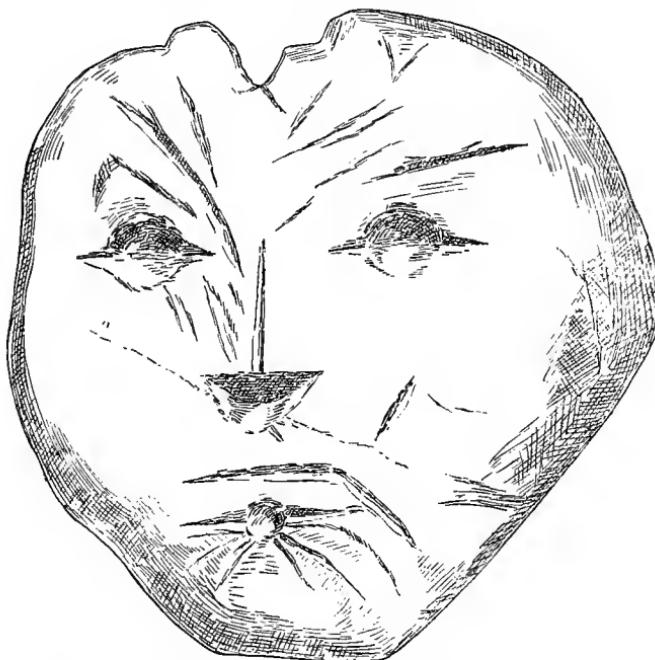


Figure 2.—Crude attempt at human portraiture. Stone.

extent in the valleys of streams near their outlets into the ocean.

Before dismissing this subject it is well to consider the ruder attempts at accurate representation. These vary to a marked degree from the most child-like effort to those nearing artistic success and are of especial interest as showing

those who produced the better ones were well in the line of advancement to true artistic production, and it therefore becomes less remarkable that such a face as the "Sphinx" should be modelled by one of these people.

If the rudest efforts were the earliest, this, of itself, would indicate a long period of occupancy of the Delaware Valley by the Lenni Lenâpè, but there is no reason to think this, but rather that skill was as rare among them as lack of it was common. Figure 2 represents an excellent example of the attempt to depict a face by combination of lines and deeper incised depressions for the eyes. There appears to have been a perforation in the forehead so that the stone, as an ornament, might be suspended and perhaps worn as were the large silver medals of a later date. Even simpler combinations of lines and dots, apparently intended to represent the human face, have been found, but so far as I have been able to determine, these lines and dots, so characteristic of the ornamentation of pottery, was never intended to be otherwise than purely ornamental and without suggestion. The face, when carved, was usually in steatite, and often was very small [See Volk, Arch. of Del. Val., Fig. 25, p. 186], or so large that the term "mask" may be applied to it [See Abbott, Primitive Industry, Fig. 371, p. 394] carved in sandstone.

While, as thus appears, the face was a common object for artistic effort, I have never seen the entire human form in stone or clay, and it is partly because of this that so elaborate a grouping as that of the well-known "Lenâpè Stone" bids one pause when asked to consider it as the work of a Delaware Indian, and at so remote a date as when these people were familiar with the mammoth and mastodon. Such grouping appears to have been a late accomplishment, and of the central western rather than the Atlantic coast people. On the other hand, when we find that such an artist as the

modeller of the "Sphinx" lived centuries ago on the banks of a little creek flowing into the Delaware, the thought arises, might not, after all, an artist, in grouping, picture the tradition that we know was current concerning some mighty and destructive beast? If this can be shown, the objections to accepting the "Lenâpè Stone" as genuine are reduced to a minimum. My own opposition largely disappeared when, for the first time, I saw the "Sphinx."

Figures 3 and 4 are the work of the Indian, and undoubt-

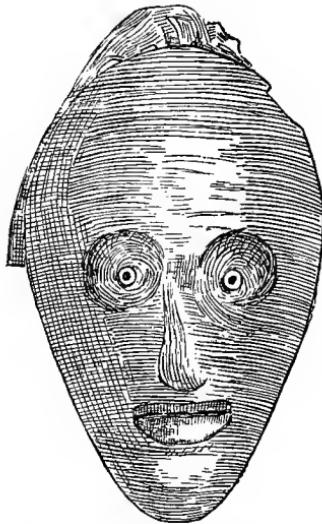


Figure 3.—Miniature mask. Wood.

edly after the time of European contact, but do not suggest any influence from that source. Carved in wood, and evidently with a metal tool—hence post-European—the skill of the carver is apparent. Figure 3 is, to me, the more impressive, because it is a combination of the face of our common barn owl (*Aluco pratincola*) and that of a man. The artist clearly had a sense of humor and the owl, Gokhos, was prominent in their folk-lore. If this example of Lenâpèan art was intended to caricature some prominent man

of the tribe at that time, which is improbable, or was inspired by some current tradition, far more likely, it is certainly highly creditable.

Figure 4, on the other hand, is simply a human face, and by no means an attractive one. It is suggestive of the Lenâpèan countenance, but not a portrait. That it should have been looked upon as ornamental and the prominent feature of its owner's personal decorations or "jewelry" is not improbable. The vanity of the Indian was pro-



*Figure 4.—*Miniature mask. Wood.

nounced. He scouted the idea that Nature, when undraped, was adorned the most. His tastes, as we view them, were barbaric. That such objects, as a class, had some significance is quite possible, but unfortunately we know nothing of the mental processes of the prehistoric peoples of this continent. Their various rites and ceremonies are an enigma to us. They had no "religion" as we are supposed to understand that exceedingly indefinite term.

Figure 5 is far more elaborate as a charm, ornament or whatsoever we may be disposed to call it. It is antler, hard, polished and, like the preceding, has been carved with a metal tool. Jasper flakes might have been used, but the

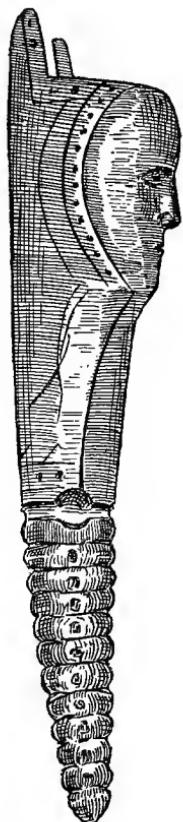


Figure 5.—Carved antler.

specimen, like the two wooden faces [Figs. 3 and 4], gives the impression of the use of a single and more effective tool than any stone implement could possibly be. The face is modelled with comparative accuracy and the addition,

admirably represented, of the tail of a rattlesnake suggests that we have in it an object that meant more to its owner than mere personal adornment. Speculation on this line, however, is without demonstrable result. As in many another line of investigation, we can imagine a great deal and prove nothing.

That the Lenni Lenâpè were artistic in temperament, however faulty the results, from our standpoint, is shown by other products than such representations of the human face—excluding Fig. 1, the “Sphinx”—for accuracy of ornate design is evidence in Figure 6.

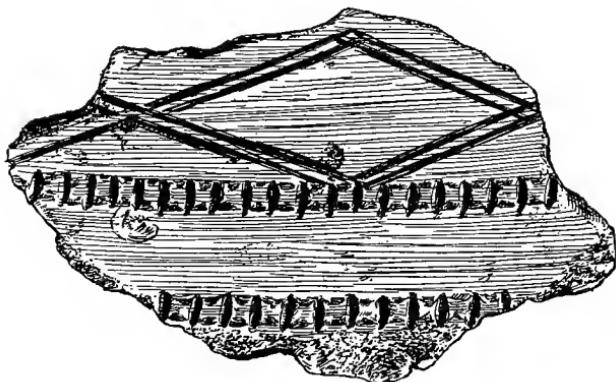


Figure 6.—Potsherd showing artistic decoration.

If the initial markings on pottery was simply a line, or two or three of them, as the lumberman's marks on his logs, to denote ownership, it can be seen how this gradually became not a mere matter of convenience, but of taste, and that which was eminently prosaic at the start became later really poetical. Figure 6 illustrates this. It is a fragment of the rim or neck of a vessel probably of a gallon capacity. One can readily see that this design continued around the rim would have a very pleasing effect, and is far too elab-

orate for mere ownership indication, and yet is of a character that puts aside all suggestion of significance of a symbolic character. It is simply Indian fancy and much more artistic than the blue stripe encircling yellow earthenware bowls that used to be common in the kitchen.

That the application of pigments to clay did not occur to the Lenâpèan potter is the more strange, considering how liberally they applied it to themselves. The source of supply was near at hand, for in the Columbia gravel area, particularly near the writer's home, are found thousands of limonitic concretions, which are filled with an almost impalpable powder, white, yellow, vermillion, green, blue, brownish-purple and black. These powders proved to be excellent pigments, even if rubbed dry upon the skin, and as I have found by experience, "pertinaciously persistent" when mixed with grease. There is no more common relic of the Indian on one-time village sites, and occasionally among grave-contents than the "shells" of these concretions, broken for sake of the contents. Yet these colors, as applied by the Indian, were not permanent. I have never found a relic that retained a trace of them, or detected its evidence in any grave that I have examined. Many stones utilized by them were sufficiently porous to have absorbed the color and retain it, as would their pottery. Paint, therefore, appears to have been applied only to the Indian's person and his perishable effects.

Brinton [The Lenâpè and their Legends, p. 53] records: "The paints and dyes used by the Lenâpè and neighboring Indians were derived both from the mineral and vegetable realms. From the former they obtained red, white and blue clays, which were in such extensive demand that the vicinity of those streams in New Castle county, Delaware, which are now called White Clay Creek and Red Clay Creek, was widely known to the natives as *Walamink*, the Place of Paint."

The Lenâpè in quest of paint, dwelling here in the valley of the Delaware, need not to go so far from home for his colored clays, as they abound here of more than the three colors mentioned by Brinton and are so near the surface in places that no labor was needed to procure any reasonable supply. [It is this exposed clay that supplied the material for those "red bands" in the "yellow drift" which are such a suggestive feature in the problem of the antiquity of artifacts lying beneath them.]

Concerning Indian paints Brinton further states: "The vegetable world supplied a variety of dyes in the colored juices of plants. These were mixed with the acid juice of the wild, sweet-scented crabapple (*Pyrus coronaria*; in Lenâpè, *tombic' anall*), to fix the dye.

"A red was yielded by the root of the *Sanguinaria Canadensis*, still called Indian paint root; an orange by the root of *Phytolacca decandra*, the poke or pocoon; a yellow by the root of *Hydrastis Canadensis*; a black by a mixture of sumac and white walnut bark." [For further information on this subject see Martin: Account of Principal Dyes of American Indians. Transactions. Amer. Philosophical Society, 1st series, vol. III., pp. 222, *et seq.*]

Brilliant color, symmetry and fairly effectual accuracy occasionally obtained, it is not strange that in time an artist appeared among these people equal to the modelling of the "Sphinx" and certain other creditable productions, such, at least, as the carved antler described.

When we glance over a series of celts, or grooved axes, it will be noticed that symmetry is characteristic of them as a class. When the selected stone—usually a water-worn pebble or cobble—had some trifling inequality that did not interfere with efficacy it was pecked away, and frequently the entire surface was polished, when the natural surface was all that utility called for. Such expenditure of labor

seems to have been to meet the demands of the æsthetic sense. Certainly the polished celt, that cosmopolitan form of stone implement, never offends the eye by reason of indifference on the part of the fabricator; yet given the sharp, cutting edge and a comparatively smooth surface and every requirement as a tool is met. They vary indefinitely as to size and detail of finish, and while the type may be said to be oval in section and sometimes nearly cylindrical, others are flat and thin, such as figure 7, a pattern very unusual in the valley of the Delaware. It was one of half a dozen found buried together, and no one quite the duplicate of the others. They were within the limit of the "yellow drift," but a hole had evidently been dug for their reception, as the character of the surrounding earth clearly showed. The purpose of such an implement is not clear. It bears no trace of having ever been used; no striaæ or sand-scratches, showing contact with the ground, or any abrasions from violent contact with any substance as hard as itself. Fragments of celts like this I have never seen.

Somewhat similar, yet in one respect quite different, is figure 8, which is of coarser material, not polished, and with short wing-like projections from each side of the blade. The purpose of this is not apparent. This is quite a local form, I think. I have seen perhaps a dozen, all found singly, associated with the ordinary forms of Indian implements. This, like the preceding, if originally chipped from a mass of stone, has subsequently been so rubbed down that no trace of the original work upon them is now traceable. While abundant throughout the region here mentioned, the Lenâpè Land of my researches, celts of the common patterns or of any of the more aberrant forms, do not occur associated with the forms that are characteristic of village sites. They were not used, out of preference, instead of the grooved axe, but had a place of their own in the Indian

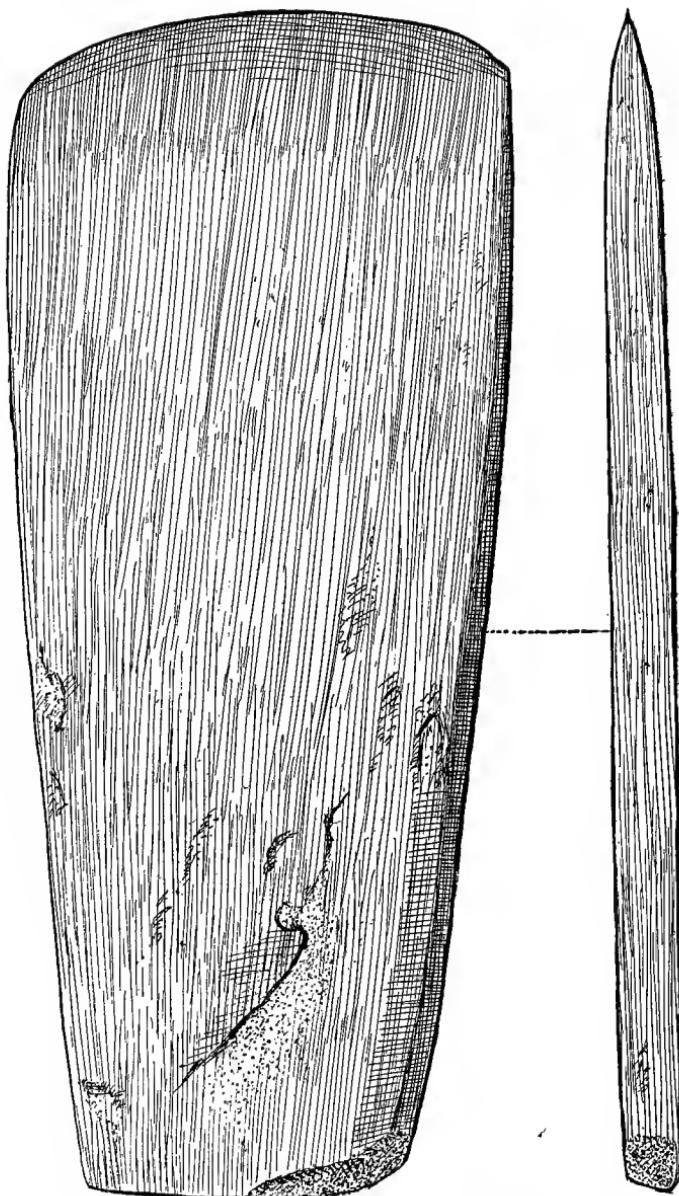


Figure 7.—An unusual form of celt. Sandstone.

economy, which is not known and probably unascertainable. Why buried? It is probable that such implements as were not in constant use were concealed in this manner as a precaution against loss or unwarrantable appropriation. If so, it would seem applicable to every form of implement, not perishable, but these caches are not a feature of the distribution, at present, of all artifacts. I have knowledge of but one cache of grooved axes. It is of some interest that within a few rods of where figure 7 was found a very large number of celts of the ordinary pattern, oval in section, were discovered. It would seem as if the high land about the first considerable creek south of Trenton, N. J., was the home of implement makers.

Again, on this point, I quote Brinton (q. v. p. 43): "The *Sanhicans* occupied the Delaware shore at the Falls, near where Trenton now stands * * * (they) were * * * undoubtedly *Lenâpè*. Campanius, who quotes the name of the place in 1642, classes them as such. * * * Their name has lost its first syllable. It should be *assanhican* * * * from *achsín*, or, in the New Jersey dialect, *assum*, a stone, and *hican*, an instrument. They were distinctively 'the stone implement people.'

"This is plainly with reference to their manufactures near Trenton."

Not only was it the manufacturers' headquarters, but here were skilled craftsmen that produced artifacts of unexcelled workmanship, and as the collector goes farther and farther afield, the relics are of ruder finish, until in the southern end of the state, or below Greenwich, in Cumberland county, a new field is entered, where excellence in workmanship is again noticeable; but no one locality in the state is as remarkable for general excellence of the stone implements found therein as between Trenton and Bordentown, on the New Jersey side of the river. This explains

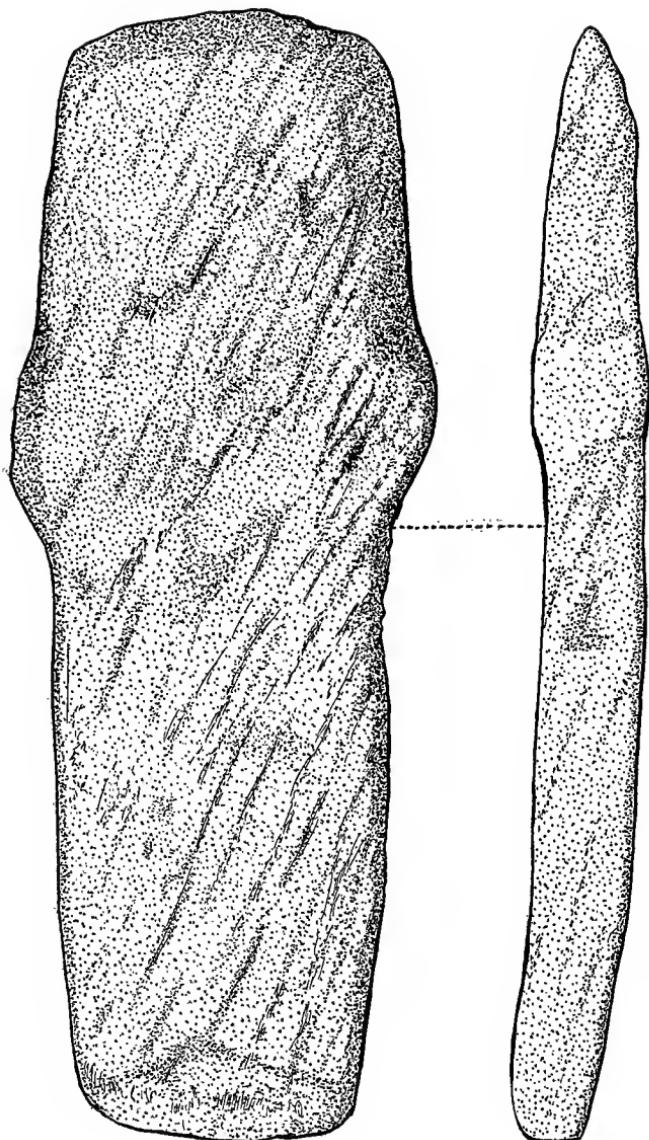


Figure 8.—Celt or adze. Stone.

why here was their most important town and why in the (to them) sad days of European invasion they still clung to it, although the Dutch and Swedes were not ideal neighbors from their point of view, and it was for this reason, doubtless, that the so-called founder of Trenton, Mahlon Stacy, came as late as 1680, and erected a mill near the mouth of the Assunpink Creek. He came into no unbroken wilderness, but a long-settled country, and as late as 1703, Tedyuscung was born here, "that great chief" who was so prominent at the Conference at Easton in 1757.

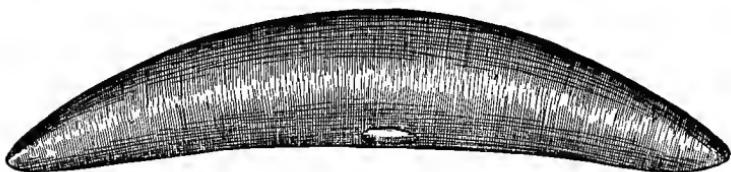


Figure 9.—Ceremonial object—Baton head. Stone.

The eye of the artist, though untrained from our point of view, is well in evidence when we come to consider a group of polished stone implements that are probably correctly described, though indefinitely, as "Ceremonial." The term "Problematical," now in common use, simply asserts the ignorance of those who use it. Figure 9 represents an unusual form, as these objects occur in the valley of the Delaware. The "wings" are usually thin, broad, and not so long as in this instance. If, as is probable, they are derived from the double-edged axe of South and Central America, their history is of much interest. If an invention of the Lenâpè and other northern tribes, as such objects as we now find, it is clearly evident they were put to no practical use, although the specimen here figured is of sufficiently dense material to be effective as a weapon. The finest examples of the Ceremonial objects that I have seen

from Lenâpè Land were collected in Atlantic county. The beauty of the material, a chalcedony-like steatite, and accuracy of outline were remarkable. As I have mentioned elsewhere (*Archæologia Nova Cæsarea*, II., p. 67), it is a remarkable fact that no mention is made of these objects by the early writers, suggesting that they were not in use when the Lenâpè met first with the Dutch, then the Swedes, and finally with the "devouring English."

In my own experience in collecting I have found, I think, but five unbroken specimens and of fragments, mostly halves, about one hundred. These did not, in any instance, occur under such circumstances as to be suggestive in any way; merely surface-found specimens.

If little can be said of the elaborate Ceremonial objects because of our woful lack of knowledge concerning them, the same is not true of natural pebbles of unusual shape which quickly caught the eye of the Lenâpèan wanderer and were gathered by him, and, it may be added with some confidence, cherished by him. If small, these pebbles, attractive by reason either of shape or color, were, to their owner, amulets, for belief in the Evil Eye was universal and in a modified form of superstition, these same pebbles might have been carried for some specific purpose, just as supposedly intelligent people now carry a horse-chestnut to ward off rheumatism, or a rabbit's foot to ensure luck. There probably has been no phase of humanity since the lower horizon of the stone age wherein fanaticism did not or does not figure, and strangely enough civilization, of which we are so proud, only refines, but does not eradicate it, albeit real knowledge, or that of Nature only, tends to reduce it to a minimum.

That certain pebbles among contents of graves were placed there as the belongings of the dead is practically demonstrable because they are such as do not occur in the surrounding soil, but were brought from a distance.

Larger stones that by reason of their shape might be made useful were selected from the gravel deposits and carried to village sites. In no other way can we explain their occurrence where no natural agency could have transported them. So far as my experience goes, they are not found unassociated with those varied forms of implements

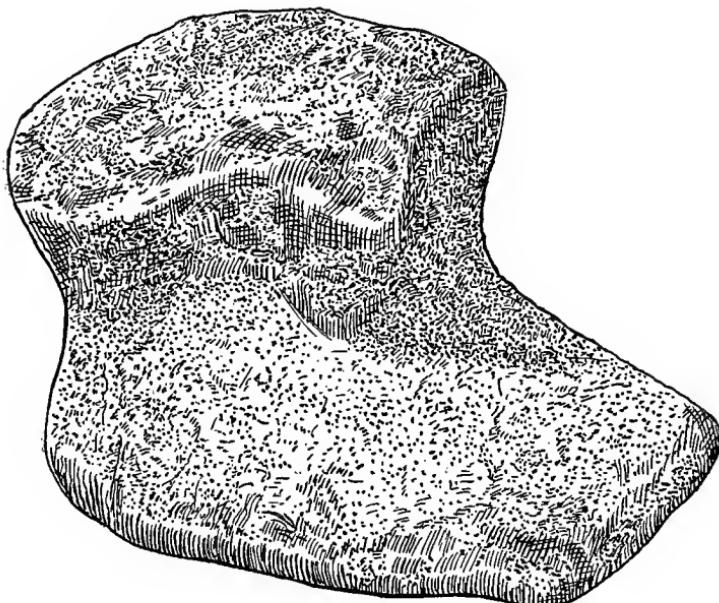


Figure 10.—“Lap-stone.” Limonite.

characteristic of a village site. Figure 10 is an excellent example of these natural forms selected for utilitarian purposes. It may have been an anvil or a lap-stone. It matters not, but the fact remains that it was found where, to the very last, Indians dwelt on the bank of the river, near Trenton. The specimen measures six inches by four at the base and the top four inches square and it is four inches high. The weight is six pounds. As a lap-stone,

held between the knees, for cracking nuts, it cannot be improved. Perhaps that it was found very near an extensive nut-orchard of the Indians may be a mere coincidence. This possibility must never be overlooked. Graves were shallow and the ground above the bodies has been frequently disturbed since the interment. Field mice burrow and the box tortoise buries itself beneath the roots of the grass. Nothing strange then that a colonial coin or one of England of pre-revolutionary date should be found among the bones of a buried Indian. It does not modernize the burial. The wonder is that there has not been more of this confusing or misleading commingling of objects old and new. Certainly, were the present surface of our fields to be covered a foot or more deep with a new earth and become a sandstone, the "fossils" in it would puzzle the most painstaking paleontologist. Objects covering the lapse of centuries from glacial man to campaign buttons would be found in the same "horizon." It was not so when the country was inhabited by children of Nature, and Nature held her own and hence it is that the traces of the man of the glacial gravel, of the "yellow drift" and of the "black soil" have been kept, to so great an extent, separate and apart.

That the occasional boulder, dropped from some ice-raft, and later, becoming a prominent object in the landscape, should have been the source of folk-lore and the centre about which they gathered for superstitious mummeries, is probable, and it is a surprise to me that I have never found any trace of intentional alteration of the surface, but in one instance, the removal of the earth about the boulder resulted in finding a compact ring of earth, blackened with charcoal that suggested the Indians having been accustomed to dance about the stone, with flaming torches, which would explain the presence of charcoal in the well-trodden path.

the other hand, no "standing stones," stone mounds or ed areas occur in that portion of Lenâpè Land herein sidered. For them, we must go up stream to near the ction of the Delaware and Lehigh rivers. Here such ditions are frequent and very naturally, considering the ndance of material. If anything akin to them ever urred here, in the tide-water area, it was in the shape of earth-work which has long since disappeared; and here distinction must be drawn between natural hillocks and th-works. The former appear to have been used as ial places, judging from the following in Barber and wes' Historical Collections of New Jersey. Treating of llingboro, Burlington County, these authors relate that 1 the bank of the Rancoces stood an ancient tree which v (1884) shows * * * the tumulus formed by the ives of the Indians. There they used to be brought on ckers, on men's shoulders, and were interred in sitting tures, surrounded and defended by upright wickers." is was a natural hillock into which the graves were made. Not wholly disconnected with consideration of the Lenni âpè and their art, as we understood the term, is their tude towards so-called idols and their manufacture. Brinton states "they rarely attempted to set forth the divinity in image. The rude representation of a human head, in wood, small enough to be carried on the person, or -size on a post, was their only idol. This was called *inkhoalacan*." The head chief's home has been stated have had the face of a grave old man cut on each door t. Brinton further states: "occasionally rude represen ons of the human head, chipped out of stone, are ex- in those parts of Pennsylvania and New Jersey once abited by the Lenâpè. These are doubtless the *wsink- lacan* above mentioned." [Lenâpè and their Legends, 68.] Zeisberger in his dictionary of the Delaware In-

dians gives *Mesink* as their word for idol, but is there sufficient warrant for the belief that these representations had any significance such as we give to our word idol? It is so natural for us, with our anthropomorphic ideas concerning the supernatural, to assume that the Lenâpèan attitude towards this hopelessly undemonstrable subject, was the same as ours. The Indian possibly was not concerned with anything more mysterious than an attempt to retain the goodwill of the ghost of his grandfather.

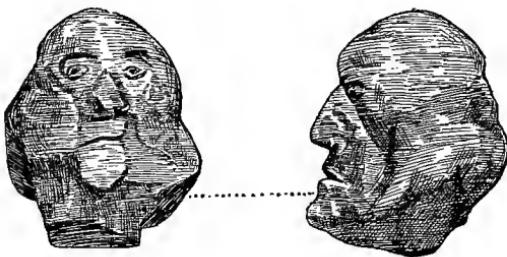


Figure 11.—Head of Idol, from Monmouth County, New Jersey.

Figure 11 represents an example of a so-called Idol from New Jersey. It is carved from an indurated clay-stone from the cretaceous plastic clay cliffs on the shore of Raritan bay, near Keyport, New Jersey. The height of this fragmentary carving is five and one-half inches; the breadth, four and one-eighth.

Surprising skill in other directions was not uncommon, but, because of the character of its product, is less likely to attract attention. It is one thing to make an implement that will meet its purpose, and another to so shape and finish it that the object pleases the eye as well as fulfill the demands made upon it. The manipulation of jasper and quartz was brought to perfection by the Lenni Lenâpè. There were those among them, did they see fit, who could chip this resistant rock to any desired shape and give to it a sharpness

point and a cutting edge that no mechanician of to-day could approach. "Sharp as a needle" is no extravagance of description as applied to many an arrowhead that I have heretofore seen.

Evidences of advance in skill, which did not so forcibly impress me when I penned an earlier publication,¹ more systematic research shows may be traced in some localities that have been practically undisturbed since Indian occupation. Progress in such directions is impracticable unless a people are permanently settled, and when we survey the handiwork of their several craftsmen—for specialization in occupation had become established—we can arrive at no surer conclusion than that these people reached Scheyichbi (New Jersey) so long ago that all attempts to ascertain the precise or approximate date are hopeless.

It is evident that the armature of the shafts of both spear and arrow might have been more simple than they were, and yet fully as effective. Much reason lies in the varied types of arrow-points, if the original shape of the flake or chip of jasper, quartz or argillite had any determining influence, but this does not apply with the same force to the arrow-head, which was, I think, predetermined as to its form by the man who made it. There has been some discussion as to how far the Lenni Lenapé were spear-men as well as arrow-men. Every man was an archer, but was he equally adept in thrusting a spear or launching a javelin with unerring aim? Those who earliest saw the Indians are silent on this point, although Brinton quotes *Relatio Itineris Marylandiam* to effect that the Susquehannocks employed a weapon "a strong and light spear of locust wood."

The reported use of the shield by Bishop Ettwein (Bull. of the Pa. Hist. Soc., 1848, p. 32) has more, or as much,

bearing on the use of the bow as of that of spears, yet spears were once, if not always, in use, as the abundance of stone heads testifies, and the Lenâpè language has its bearing on the subject. *Brinton speaks of the tanganadun in "Legends,"* and gives *tanganikan* and *tangandikan* in the Brinton and Anthony "Lenâpè-English Dictionary." Zeisberger has no word for "spear," but gives *Pepachkhamátunk*, a lance.

As a large, sharpened stone attached to the end of a long stick, and as a weapon, wielded by the hand, the spear, being far the simpler, foreran the bow. If, then, it can be shown that the use of the bow originated among the Lenâpè or their ancestors, *on this continent*, which is highly improbable, it might explain, in a way, the comparatively small number of spears as compared with arrows; the proportion not being, from any tabulation of relics, as found in New Jersey, quite one-tenth of one per cent. It would seem that the spear was largely discarded for the bow and arrow for a long time prior to the introduction of firearms. They might, indeed, have become merely insignia of office, for some specimens of chalcedony has been found that would illy withstand the brunt of conflict.

Figure 12 represents a less usual type of spear-head than the larger and narrower blades, of which fragments are common in some limited localities, and wholly wanting in others. It does not suggest a useful or effective weapon. Even when newly-chipped, and sharper than now, the foe or the hunted beast must have been very non-resistant to be seriously wounded by it.

Interest centers in this specimen because of its being one of a very large number, mostly broken, and confined to a very small area—a field of about nine acres in extent. As little else of Indian origin was found with them, it gave rise to the impression of a battle here. As there was no

other weapon found, and the contending "armies" must have been armed identically, it is quite apparent that the

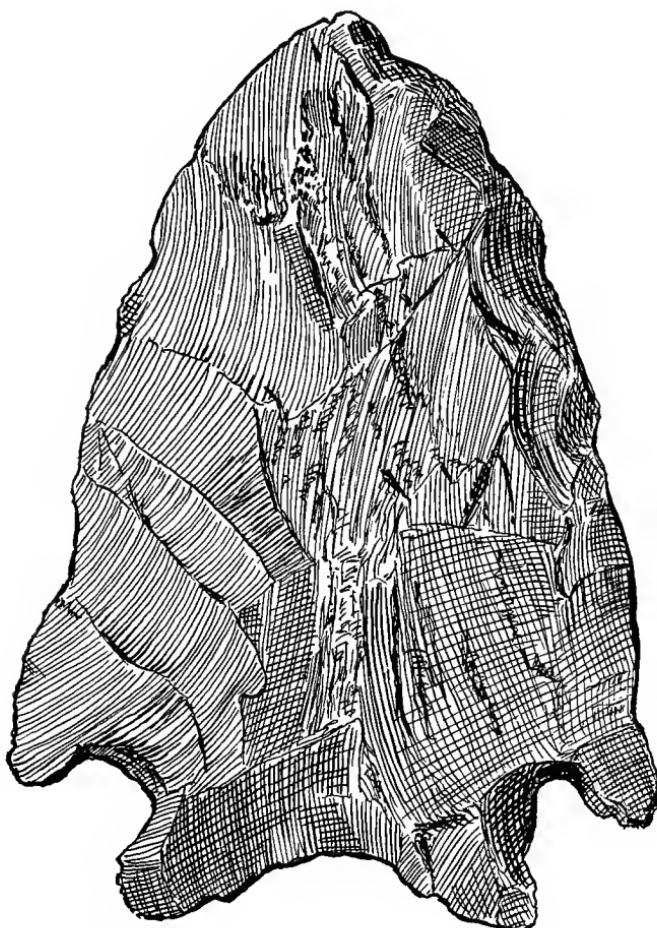


Figure 12.—Flint spear-head.

true explanation is that here had been a cache of some three or four hundred of these spear-heads that had been scattered

in colonial days, when the field was cultivated. Abandoned later, it had its second growth of timber, which, being felled and the land again put under the plow for the second time, exposed these specimens.

It is well, here, to refer in some detail to the ascertainable history of the surface of the ground now under cultivation in the immediate valley of the river. The original settlers were by no means intelligent farmers. They were too eager to acquire wealth, and so took all they could from the earth, and put nothing back. Many a clearing soon became barren, was abandoned, and subsequently became overgrown with shrubbery and some tree-growth. This was cut off in time, the shrubbery grubbed up, and the land re-planted. Is it any wonder then that some fields, as they now are, are exasperatingly contradictory from the archæological standpoint? An examination of some old documents with reference to land among the earliest cultivated, shows that some fields were twice abandoned before intelligent methods were adopted; all of which explains the occasional discovery of Colonial pewter buttons when digging a well or a cellar, and which is always heralded by the crass ignorance of the newspaper reporter as a proof that no dependable trace of antiquity has ever been obtained. Of course, fanaticism clutches at all such "discoveries" with childish glee.

It is only where the plough has never turned a furrow, that the archæologist is on absolutely safe ground, or when he digs much deeper than the ploughshare ever reached. The immediate banks of the inland streams, which since the day of the Indian have been protected by forest growth, are "certain" grounds into which to probe, and with abundant confidence, notwithstanding the forbidding frown of the geologist, who is all enterprise and sanity, when fossils are to be found, but listless and illogical when there is a rumor of "relics" in the air.

The one familiar form of aboriginal artifact, recognized at a glance, even by those who know of Indians through

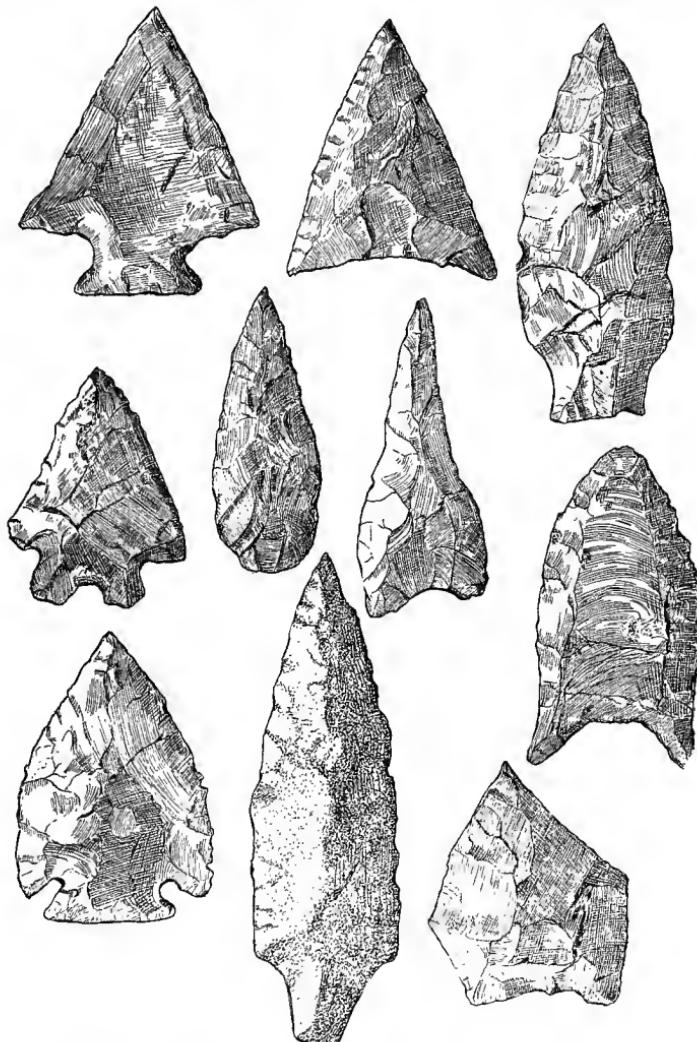


Figure 13.—Jasper arrow-points of ordinary patterns.

hearsay only, is the carefully clipped quartz, chert, jasper or argillite arrow-point. Their name provides that knowl-

edge which is necessary. They are evidence of the use of the bow as a weapon, but more largely as a hunting implement. As relics of the one-time stone-age hunter, enough has been written to meet the demands of the most insistent, and attention is here called to them with regard to certain conditions of their distribution. Figure 13 represents a group of the common patterns.

Considering the use to which they were put, it is natural to think of their fairly uniform distribution, but I have not found such to be the case. It is true, that every acre of land in New Jersey is likely to add at least a single specimen to the collector's hoard, and if the ground could be run through a sieve, probably another or a couple might be gathered; on the other hand, I have gathered over a thousand from a five-acre plot, nor exhausted the locality, as others on the same quest, at other times, have gathered from the same acreage two or three times as many more. As scattered points, lost by the hunter, in as much as all ground except village sites and corn fields, was hunting ground, I have always thought they should be more abundant, for as single specimens, here and there, they are readily explained.

Only the head of an arrow,
Here in the barren sand;
What of the bow and archer,
This trifling weapon, planned?

Where in the forest fastness,
Where on the open plain,
Where in the river's valley,
Does trace of him remain?

Silent the shout of triumph.
Silent the dying groan,
Victor, alike with vanquished,
Long centuries a-gone.

Only the head of an arrow,
Where is the game it slew?
Weary beast that bit the dust,
The swiftest bird that flew.

Only the head of an arrow,
But never the game it slew;
Only the sand about it
And air it hurtled through.

Only the head of an arrow,
So deftly wrought in stone,
But not the hand that shaped it
Or cunning tool of bone.

The sand here tells no story,
The arrow, too, is mute;
Let fancy weave a legend,
Though time the tale refute.

It is the marvelous abundance of arrow-points in circumscribed localities that is difficult to explain. If associated with chips, unfinished and broken specimens, we have evidence of an arrow-maker's workshop, but these are few and scattered, while areas are known to me, as to others, where only the finished point is found and in great abundance, every year's plowing bringing a new "crop" to the surface. A solution of the problem, not satisfactory to myself, but the only one I can suggest, is, that the Indians had here a treasury or storehouse of these points, which was destroyed when the country was deforested and by subsequent up-turnings of the soil, in cultivating the land, the scattering became more and more pronounced. That this should happen is not impossible, certainly. I recall finding a half of a ceremonial object of unusual pattern and material, and several years later finding the other half, and the broken surfaces were not so abraded as to prevent a perfect restoration of the specimen. On the other hand,

while discoveries are continually made of "blades," discs and oval "knives," I have never learned of the discovery of a cache of arrow-points, or of those other small jasper implements, the drill and the scraper.

In these, the drill and scraper, we have implements that are wholly of domestic purport and supposedly, should occur only in village or wigwam sites. This is true of probably ninety per cent. of them. It certainly is in my own

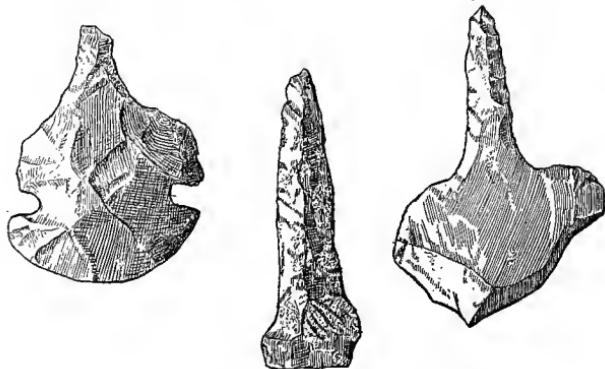


Figure 14.—Jasper drills of ordinary forms.

experience in collecting. Figure 14 represents three examples of these objects as we generally find them, but there are a dozen variations in the shaping of the base of the implement. Of three or four thousand that I have found, few are perfect, and not half a dozen that show any sign of use. This fact has brought up the question whether they really were what the common name for them indicates. That they had no other use is possible, and yet it is difficult to see in the bases of some of them anything but a hindrance, and certainly none such could have been used with the bow-drill apparatus.

As a domestic implement, even on the site of a village that had been long occupied, we would expect to find but few

examples, and these broken and therefore discarded. It is otherwise in the valley of the Delaware, near the head of tide-water. Small areas are, or were, known for the great numbers of these implements, and it is again suggested that these drills were made here for distribution. For drilling thin discs of stone, such as we find in considerable abundance, they do not possess any advantage that I can determine, or any chance flake of silicious stone that has a point. I have perforated many such pieces of slate and steatite readily and quickly with a flake and always found the carefully chipped drill rather an unsatisfactory tool.



Figure 15.—Jasper scrapers of usual patterns.

The scraper (Figure 15) is much more common than the drill in the region whereof I have been treating. More skins were cleaned for clothing than pebbles were perforated for ornaments, and so the scraper is almost as common as arrow-points where there has once been an Indian village. As in the case of drills, their phenomenal abundance in circumscribed areas indicates they were made there, for here, at the head of tide-water, was the grand centre of implement manufacture. The variation in shape is pro-

nounced, and for this no reason is apparent, as the elaborated forms possess no advantage over the simple flake with its carefully bevelled edge. Occasionally a specimen is found that distinctly shows signs of wear, but the vast majority have no mark upon them suggesting they had ever been handled since they left the workshop of the maker. Some are very small, yet perfectly worked, and this is true also of the jasper drills. Their purpose is problematical. While the smallest drills often have an elaborate base, notched or barbed, the diminutive scrapers are flakes only with such secondary chipping as was necessary to give them a "scraping" edge. I have gathered specimens less than an inch in length.

A word may well be added here concerning one form of chipped implement, usually and properly referred to the Indian, which is quite as common as the arrow-point, but far less frequently found in unbroken condition. Figure 16 represents an average example of these "blades," as they have been called, and their history linked to the "rejects" on the river shore, or true palæolithic implements. As "trimming sites" never materialized and all other "missing links" remain missing, the whole subject is now one no longer seriously considered.

There are two conditions under which these implements occur that are of interest. They are more widely spread than any other form, not excepting the axe, celt or arrow-point; and they occur in caches, and these deposits must have been very abundant in pre-colonial times, if the scattered and broken specimens are to be explained as the dispersion by cultivation of the soil of a cache here and there. It was supposed at one time that these blades had to do with the cultivation of maize and melons, but since 1881, when this view was expressed (Abbott, *Primitive Industry*, p. 220), I have found so many hundreds of these objects that I am

now convinced that they were never put to any use, as a recent examination of over one thousand in collections made by different collectors failed to show any unmistakable traces of use. Not one was striated, worn away at any point or was hand-polished. They are finished objects, it is certain, for no one has ever found a specimen that had been modified in the direction of converting it into another form.

An examination of a series of these objects, as cached, shows that no collection in the valley of the Delaware is exclusively of one material. The triassic red shale, slate, chert, as well as argillite, was used, and in some caches examined what appeared to be argillite at first glance was in no instance that material. Rock, much more easily chipped than argillite, was usually used, and I have never found one of these blades, or a fragment of one, that, if argillite, was decomposed to anything like the extent of many an arrow-point, knife or larger implement.

It is highly probable that, as has been suggested (*Handbook of American Indians*, p. 179), these caches have to do with mortuary customs or rites that became established through the diseased imagination of some one-time leader, but we know too little of the psychology of the Indian to venture further than to merely suggest. These blades, like some points in archaeology, had better be left for the future student to ponder over. As it is, because so little is known about them, so much has been said.

The polished slate knife, semi-lunar in shape and either with perforations for attaching the blade to the handle, or with a back of the same material, but twice or three times as thick as the blade, is a form of implement so common in the valley of the Delaware, from the head of tide-water to the sea, that it calls for more than passing mention. It is essentially a domestic or household implement. It is designated as the woman's knife. In Rink's "Tales and Tradition-

tions of the Eskimo," one is figured in the frontispiece of this most interesting and instructive work. In 1881, when I published my "Primitive Industry," I was inclined to be-

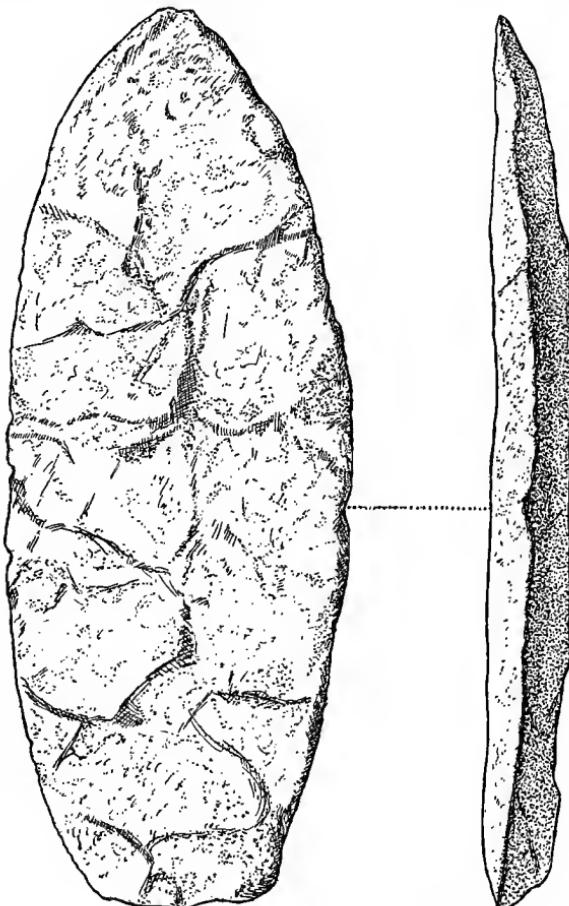


Figure 16.—Example of the "cached" argillite implements so common everywhere.

lieve that these knives were more abundant in New England than in New Jersey, but this is quite a matter of doubt now. While found throughout the State, as I have seen examples

from every county, they are a prominent feature of the coastal plain, and village sites near the sea or in the immediate valleys of the main rivers never lack them. They are not familiar to many collectors for the simple reason that as fragments they have been overlooked. The suggestion that they were largely used in cutting large fish or the blubber from stranded cetaceans sounds well, but, as a woman's knife, they seem to come as well under the class of household utensils for cutting anything that the material could be made to cut. Figure 17 represents an average example of this form of knife.

As an Eskimo form of knife, the question may be asked,

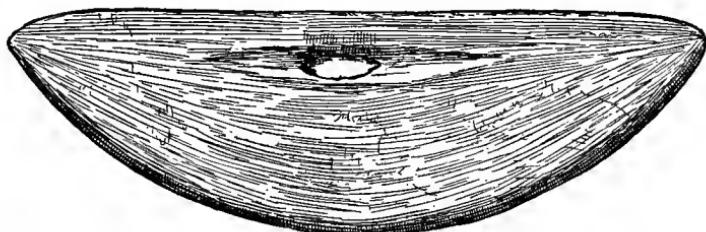


Figure 17.—“Eskimo” pattern of slate knife, common in Delaware River Valley.

were they introduced among the Lenni Lenâpè as a consequence of the latter wandering as far north as the St. Lawrence or beyond, or did the Eskimo range along the Atlantic coast as far south as New England and New Jersey? If the Lenni Lenâpè were once in contact with the Eskimo in the distant northeast this knife might have been in common use among the two peoples, but when the Lenâpè wandered west and circled about, and some of them came eastward, they do not appear to have carried this pattern of knife with them. It may, on the other hand, be an independent Lenâpèan invention, or copied from Iroquois. It is useless to conjecture, and now the most interesting fact connected

with them is their abundance in the southern half of New Jersey. Here they were certainly in constant use. I have seen fragments of a dozen or more picked from a single shell heap, and where they seem most abundant, there, in Indian times, fish were extremely abundant, and we know that the Lenni Lenâpè had many devices for taking them.

We have but to glance at the map of New Jersey, or far better at the old colonial maps of more than a century ago, to see how thoroughly watered was this Lenâpè land in the days of their possession of the soil; and these people had found not only every river and creek but modest inland, forest-hidden brook and had given to each a name and finally left upon their banks, imperishable evidence of their one-time presence. Pottery tells the story and the associated ashes and charcoal and fragments of burnt bone are eloquent of other days, of another people and of Nature in her glory. It is these traces of small, backwoods settlements, as we may call them, that tell us a great deal more of these people, in some respects, than do the traces of the Lenâpèan metropolis on the Delaware at the termination of the tidal flow of that stream.

If the historian to-day would gather from fountainhead some knowledge of our colonial period, he must go to the few remaining colonial houses and see there the furniture and its surroundings in use when the Georges were our kings. So, too, a village site on the bank of some nameless inland brook gives us the handicraft of the people, who, dependent on themselves, made what they needed and made it well or shiftlessly, as they were indolent or ambitious. All this was less the case at the metropolis, as the riverside town surely was, for this was constantly visited by Indians from a distance and was a centre of Indian interests, political and commercial, long before it became the frontier trading post of the Dutch settlers at Manahatta.

On these smaller and in some instances nearly obliterated inland streams, the traces of one-time settlement may be scanty, consisting even of those of one family or of one lonely hunter who preferred solitude to society—the exchange, to-day, is often a wise one. Following the bank of some of these wild streams, for they are to-day, in places, as unaffected by civilized methods of torturing Nature as during the *Lenâpèan régime*, we see no traces on the surface, no clearing along the path, no suggestion of a peculiarly fitting landing place for the absolutely necessary canoe. It is only by chance that at some slight scarring of the turf, perhaps it is the earth thrown out by a burrowing animal, that an artifact is brought to light. A single object dropped by its original owner, proves all the evidence we need that here Indians had lived. All preconceived notions, now, to the winds; it is a spade that is needed, not a pen. The object is of first importance, and when some wigwam site is thus exposed, what do we find? Charcoal, burnt bone, potsherds and artifacts. These last will be the same in pattern, if not in finish, as we have seen a thousand times before, and removed from their resting place, mean as little as the average label or the stereotyped generalities of a curator's report.

But when we come to consider how they occur, there is a good deal of light thrown on the subject. They rest upon clean sand that is darkened by exceedingly small grains of charcoal and there is always one spot where the earth has been burned until it is brick-like and it is over this that leaf-mold has accumulated until it has become a compact black soil and all tactal traces of vegetation have disappeared, and this has progressed since the abandonment of the site, until this turf is often many inches thick. Such soil accumulation was in steady progress during the *Lenâpèan* occupation and it is only during this period that the *Lenâpè*

were present. When almost barren sands were the principal feature of the territory and tree growth limited to a few evergreens, the Lenâpè had not begun their eastward march and the name Scheyichbi was yet to be coined. Absolutely all that pertains to him is now a feature of what is to us, the present, vegetation-sustaining surface soil. By this is meant the undisturbed conditions still remaining, where white man's interference has been withheld. This, by no means, modernizes the Indian. What geologists call "recent," usually with a contemptuous sniff, is not so very new as man calculates the centuries. It is somewhat significant that geologists are very chary as to statements, except in a very non-committal way, as to when the "recent" began. At once we see the silliness of dealing with figures. Soil makes slowly, if by this is meant decomposition of rock and vegetation and their intimate commingling, and accumulates at one spot very slowly, seeing how it is exposed to the action of wind and water. The summer's foliage turned to dust is so thin a film the eye cannot detect it, yet this dust of ages has built up a "soil" that nourishes all annual, and many a perennial, growth.

The decay of forest growths is also to be considered. Peter Kalm,¹ in 1749, while sojourning in Lenâpè Land, recorded concerning the "growth" of the "black soil," writes: "Old trees die away continually, and are succeeded by a young generation. Those which are thrown down ly on the ground and putrefy, sooner or later, and by that means encrease the black soil, into which the leaves are likewise finally changed." It is not then to be wondered at that occasionally we read of the occurrence of Indian artifacts at depths that seem improbable. The ever-accumulating "black soil" filled in the hollows as well as thinly

¹ "Travels into North America," by Peter Kalm (Forster's translation), London, 1771. Vol. II, p. 19.

capped the higher ground and why not into some natural depression should have fallen an artifact to be subsequently covered, seeing that wind, even in a forest is an effective displacing agent of soil in process of formation and water one of even greater power. There is nothing strange, therefore, in Kalm's reference to a wooden spoon exhumed from a depth of twenty feet and to "such a trowel (celt?) as the Indians make use of."

Lenâpè land was far more up-hill and down-dale then than now. Again it is fitting to quote Kalm, who was wise enough to ask questions and not depend wholly on his own observations. Old Swedes informed him of such changes as they had knowledge of and the story of one is practically the story of them all.

"One of the Swedes, called King, who was above fifty years of age, was convinced that about this time (November, 1748) the little lakes, brooks, springs and rivers had much less water than they had when he was a boy. He could mention several lakes on which people went in large boats in his youth, and had sufficient water even in the hottest summers; but now, they were either entirely dried up, or for the greatest part; and in the latter case all the water was lost in summer."

"Peter Rambo, a man who was near sixty years of age, assured me * * * that the water in rivers was still as high as it used to be, as far back as memory could reach; but little lakes, ponds and waters in marshes are visibly decreased, and many of them dried up."

This in 1748 when Lenâpè land had not been wholly wrested from Nature, so it need not now, one hundred and sixty-three years later, excite surprise when the statement is made that no Indian, if resurrected, could find the site of his old home, except it were on the bank of the river or the largest of the inland streams, and often, not then. Ponds,

brooks and springs dried up, and it was by them that many an Indian family lived. We know this, because, to-day, in localities apparently as level as a table top, we find faint traces of a depression and a darker soil immediately about and in it and here are potsherds and artifacts. To tell the story of such a spot is no difficult task. A spring here, the source of a tiny brook and hidden in the depth of the forest. Perhaps it was an open glade, not an acre or more in extent and the site of an Indian home. Now we have a sunny, treeless field with scarcely a trace of the original depression in the general surface, and a slightly darker tint of the soil, the sole evidence of other physical conditions.

Since general deforesting, while the surface soil still accumulates in one sense, it does not up-build the surface. Wind and water carry more to the river, where it is lost forever, than any season can produce. We are slowly and surely being washed and blown away, and many an area is barren that was fertile when pressed by the moccasined feet of a Lenâpèan hunter or warrior.

A change other than that already noted has also its significance. Kalm¹ writes: "All the old Swedes and Englishmen born in America whom I ever questioned, asserted that there were not near so many birds fit for eating at present, as there used to be when they were children, and that their decrease was visible. They even said, that they had heard their fathers complain of this, in whose childhood the bays, rivers and brooks were quite covered with all sorts of water fowl, such as wild geese, ducks and the like. But at present there is sometimes not a single bird upon them. * * *

"The cause of this diminution is not difficult to find.

¹ Vide, Vol. I, p. 289.

Before the arrival of the Europeans, the country was uncultivated, and full of great forests. The few Indians that lived here seldom disturbed the birds. * * * But since the arrival of great crowds of Europeans, things are greatly changed: the country is well peopled, and the woods are cut down: the people increasing in this country, they have by hunting and shooting in part extirpated the birds, in part scared them away."

It is not difficult to view in imagination the Lenâpè land of these pre-European people. With consummate skill Nature gradually brought it very near to the condition of the garden of oriental fable, and no sooner had the European arrived than he started it at a rapid pace in the opposite direction. To-day, the Lenâpè's Scheyichbi is well-nigh shorn of all its glory, but not of its interest as viewed by the archæologist, for happily the Lenâpè left traces of his sojourn here that have not lost their meaning. Rightly interpreted, we are, as I firmly believe, warranted in concluding that long, long ago these so-called Indians discovered the land and went up to possess it and that it was during its latest formative stage as a wilderness, if we mean by that a land whereon the forest reached that perfection which it ultimately attained. The Indian was a witness to as great a change towards what the Dutch and Swedes found on their arrival, as these people witnessed in the direction of the conditions that now obtain. This means centuries and not years.

CHAPTER II.

THE PREHISTORIC RIVER.

HECKEWELDER, in his "History of the Indian Nations," informs us that the tradition of the Delawares was to the effect that, migrating eastward—how long the journey took no man can tell. Centuries might have elapsed twixt one stage and another—that "at last they settled on the four great rivers (which we call Delaware, Hudson, Susquehannah, Potomack), making the Delaware, to which they gave the name of *Lenâpè-wihittuck*¹ (the river or stream of the *Lenâpè*), the centre of their possessions."

We see from the above quotation that the Delaware river played an important part in the career of these people—the question of the identity of this river appears not to have been exploited by the theoretical archæologists who have never seen it—and so important a part that it is fitting that the closest scrutiny should be given to every trace of early man that has escaped the destructive tread of the invading European. In the Indians' day this river was an important feature in the scheme of Nature, as it is now in the scheme of man. It drained the forests in the day of its glory as it is now the sewer of many cities in its day of shame.

It may safely be stated that from the rocky barrier that shuts out the tide at Trenton, eastward to Cape May, there is not a rod of shore or a landmark that an Indian, even of Colonial times, would recognize were he brought back to life. The river itself would not seem the same. Its filthy waters, absence of aquatic life and general aspect of deso-

¹ Heckewelder, Trans. Amer. Philos. Soc., Vol. III, p. 388.

lation, would be as inexplicable to him as it would be deplorable. It is the same river only in the sense that water still flows in practically the same channel, and the tide reaches, but cannot pass, the uplifted rocks at the "ffalles," as the Colonists quaintly called it. It was *sookpehellen* one day, perhaps, but for long the water has not had far to fall, and when but little above its ordinary stage, the evidence of any barrier is obliterated. That no marked change has taken place at this point since or during the Lenâpèan period is quite probable, and so, if anywhere, the revived ancient redman might recognize these rocks as those upon which he had stood when fishing, or against which he had unwittingly run his canoe and had had to swim for his life as a consequence.

Geologically considered, the river is now a remnant. How much less so when discovered by the Lenâpè is an open question. Many changes, perhaps, of minor consequence are undeniable. Even a century ago it was hemmed in by forests for many a mile from its source, and two centuries ago it was between wooded slopes that it met the tide at the "ffalles." In 1748 Kalm¹ went from Philadelphia to Trenton in "a small yacht" and was obliged to come to anchor "about seven miles from Trenton." He records that "the river *Delaware* was very narrow here." For at least a century it has been very broad here, the river having either carried off a good deal of the ancient shore line of the Pennsylvania side or made serious inroads in the high bluff on the New Jersey side, where Crosswicks Creek enters the river. The latter is far less likely the case, considering the formation; so a change has taken place of much interest since Kalm's visit half a century earlier.

The condition to which Kalm refers applied later, a mile or more up-stream, when Perriwig Island, now gone, was of considerable extent and so narrowed the channel. It did so

¹Vide, Vol. II, p. 220.

until well within our own time. This unstable material, sand and gravel, the sport of freshets, if not of the flowing water at its ordinary stage was constantly exposed to rearrangement then as now; islands forming and disappearing even in the space of an individual's life. Considering this, how vain to attempt to associate the Indian with the river except in the most general way. It is not strange, therefore, that it yields now practically no traces of the Indian, even where the shores but a few rods inland show abundant traces of wigwam sites, camp-fires, and even of certain industrial centres. Artifacts that may be a thousand years old and intimately associated with those of William Penn's day may occasionally occur, but they teach us nothing bearing on the one question that is of real interest, the antiquity of the people forerunning the European in this region.

To refer again to the islands in the tidal reach of the river, it may be asserted positively that not all of them were features of comparatively brief duration. The river always has been and still is kaleidoscopic in its leisured way, but some of its islands defied displacement for long periods. Their origin was different. They were not at first sand-bars that increased in volume until vegetation could take hold and secure them against even the riotous treatment of a flood. As their bases show, they were projections from the main shore, cut off from it by water and moving ice gaining a passage in its rear by such a freshet as still occasionally occurs, when the ice of a winter gives way under the pressure of melting snows. If, where an island has been and there is now only a bar, and this bared only at extremely low stages of the river, as often in August and September, we find the compacted gravel sometimes contains an artifact (always of paleolithic type), we are not to assume that it is of necessity an Indian "reject" or wastrel that had been gradually let down to its present resting place,

while the soil, sand and gravel were removed little by little, but may be exploited as an ancient artifact that was part and parcel of the original deposit that was laid down as the last act of the glacial drama or the dropping of the curtain as the last act closed. Such artifacts have been frequently found and their surfaces, when not greatly water-worn, is akin to that of the surrounding pebbles; a condition that has been too generally overlooked in the study of what has been claimed as relics of paleolithic man in the valley of the Delaware. These island-base artifacts have been subjected to the same conditions, had like experiences and for as long a time as the day when they were left, by accident or design, where they are found. All obtainable facts considered, we have no more reason to reject an artifact found under these conditions than to assert that one particular pebble was other than the millions brought here by glacial floods in the indeterminable long ago. They are as much in place, as a part of the gravel whereon found, as any artifact from inland gravel overlaid by alternating strata of sand, clay and gravel. It is claimed in the latter case, antiquity is demonstrable, and so it is, but are there no other guides to a long lapse of centuries? The reasons I have given are sufficient, I maintain, for why, if an artifact is ever conveniently floated from off shore or down the river, is it always just such a one as we recognize as the "paleolith"? When grooved axes, arrow-heads and potsherds are found under like circumstances, it is time to declare the views expressed untenable, and not till then. The truth is, we may be so excessively careful that we defeat our aims. Demanding unreasonable proof, that which is sufficient is not accorded its value. Those who seek the truth they desire after such fashion, never find it.

¹ Vide, Vol. II, p. 220.

No artifact in the Trenton gravel is as old as the pebbles that came from points miles distant up the river valley, but are as old as the day when, as the new-found gravel stratum, they found a resting place and were gradually covered with more and more sand and pebbles or some huge boulder from the source of this deposit as a whole, the terminal moraine. This is as absolutely certain as that the sun shines. There has been criticism, as stated, of this assertion but not one valid objection set forth. Mere denial and gross inaccuracy have no argumentative value.¹ Not all facts are evident at a glance. Some are very gradually unfolded, but the average visitor usually forgets this and so bases his conclusions on a glimpse or a short season during a holiday.

Any region is a strange land until it has been dwelt in for a lifetime and thousands of people die without really knowing where they lived. To tread daily the surface of a field or follow the winding footpath way of a tortuous valley may ripen into an acquaintance with the more prominent features of the place, but no intimacy is reached without constant study all the while. Much that has been written in archaeological and geological journals concerning the Delaware river, in regard to evidences of man's antiquity therein, are mere chapter-headings without illuminating text and some of these "headings" are based on entire misconception of the actual conditions.

The results of the recent extensive dredging of the river at and near Trenton, to deepen and widen its channel, have proved of much interest, as an examination of thousands of cubic yards of sand and gravel was practicable, it being conveniently spread out on a level surface, as if for my benefit. This material from the river did not, so far as I could discover, contain a single object not distinctly referable to the

Indian and but very few of them, but an occasional pebble was so far different from others that its peculiar surface raised questions as to its origin. This discussion is deferred for the present.

The one important point gained, as it seems to me, by the study of the dredged material, is that the bed of the stream had been gradually choked up since Indian times and the sand and mud were practically all of recent depositing; that is, deposited or accumulated within the period of the European settlements on the river's banks; but as the dredging continued, cleaner and coarser sand and gravel were removed that has other significance. The pebbles, water-worn and of all shapes and sizes, but not noticeably large, all had clean, semi-smooth surfaces that did not suggest having ever been in contact with the foul water from which they were taken, but rather from some of our great springs or the ocean beach. There was nothing of that discoloration characteristic of the gravel *in situ*, as where the bluff forms the river's bank at the head of tidewater. This product of the later dredging was the clean gravel brought hither by clean water during glacial floods and paved the channel from Trenton to Bordentown, some five miles, and was in time covered with sand and organic matter, sustaining a flourishing and varied aquatic vegetal growth, when the river changed to a respectable stream and laid aside all the reckless characteristics of its glacial youth. Now, in its second childhood, its replies to the geologists' questions are often wandering or confused, or it is the questioner that is all this and the river gets the blame. At all events, if the up-river gravel is steadily creeping downstream and pebbles that were at the Water Gap in 1812 are now at Bordentown, in 1912, it may be asked why the contents of the crumbling shores of Shawnee Island are not now scattered among the sands of the flats at Bordentown or points up the river?

If, too, as has been argued, or rather, brazenly asserted, that the paleolithic artifacts from the river-bluff at Trenton, had been carried down stream by the usual or some unusual volume of water, why is it that none should have occurred in two years' search over millions of water-worn pebbles, now spread out on Duck Island and the dyke a mile or so below it?

But this is not a subject that need be seriously discussed. The abundant, or more strictly, not infrequent, argillite artifacts—paleolithic—from the river-bluff at Trenton, that have been found in the talus and many *in situ*, where the face of the bluff was newly exposed through limited land-sliding, came from the bluff itself, and not from its surface. It should be remembered, too, that this surface is all gravel and is a graded street, and the original surface, that of the Indian and colonist, was removed many years ago. It is really as sane to speak of the paleolith dropping from the clouds as the surface. Of course, for reasons given, they are not the jetsam and flotsam of unusual floods.¹

The study of the material dredged from the river and deposited on the adjoining shores, has led to the conclusion that the bluff and gravel-based islands in the river were once a continuous deposit, through which the river has, since glacial time, cut its present channel and left an ancient one, has exposed these traces of paleolithic man in its every-day labor of eroding its unstable shores and not that it has by unusual exertion gathered them up from distant points and spread them in other localities, to the archaeologist's confusion. The lower or down-river portion of Burlington Island is a case in point. This island, that has a "core" of large boulders and is at its base that same gravel which is the surface feature of the Pennsylvania shore opposite, and

¹ *Archæologia Nova Cæsarea*, III., p. 23.

has a beach of pebbles not to be distinguished from the gravel at Trenton, ten miles eastward, is a puzzle, geologically, in some respects. While detached from Pennsylvania by a deep ship channel, it belongs thereto, structurally, but is surfaced by sand and loam that are characteristic of New Jersey. Archæologically, the problem of the island is dual. The ordinary Lenâpè artifacts are strewn over the surface, and along the beach; while in the gravel and on it are paleolithic implements identical with those found in and on the gravel at Trenton and on and in this same deposit at various exposures in Pennsylvania, as will be noticed later.

The lower, *i. e.*, down-river end of the island, is capped with a deep deposit of "core" sand, apparently derived from the New Jersey side of the river. It faces the river as a bluff, twenty feet high. I can get no expression of opinion as to the conditions that preceded and led to its deposition. On September 25, 1892, I visited the island with R. D. Salisbury and came away no wiser than when I went. Naturally I was prepared subsequently to read his report on the surface geology of the Delaware valley with a feeling of having read and like Poe's "Raven," quoth I, "nothing-more." If the "paleolithic" implements that have been found here on the gravel, when exposed at low tide, were only found here, it would be a fair presumption that they came from somewhere else, if this "somewhere else" could be located. Not from the surface of the island, surely, seeing they are not associated with the Indian relics that, until recently, were so abundant.

The accompanying illustration, Figure 18, shows a section of this great sand deposit and at its base, the true Trenton gravel, *paleolithic artifacts have been found*. This is only one of many instances that clearly show that to dissociate these paleoliths from the gravel and associate them with the surface soil and Lenâpèan time, is wholly without warrant.

This conclusion, vigorously combated by students generally, which I reached in 1892,¹ has been so amply confirmed by later studies of this locality, that if I had any hesitancy at the time, it has completely vanished. It is clear that Ancient Man was familiar with the Delaware river, here, before the spot was a high bluff facing the

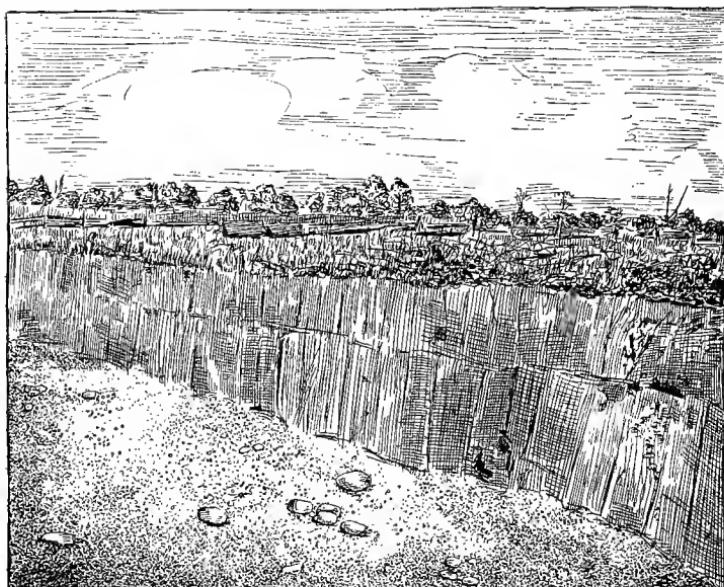


Figure 18.—Section of sand at southwestern end of Burlington Island, Delaware River.

stream, then, as now, a wide expanse of water. A mighty change took place betwixt man's first appearance and the day of the arrival of the Lenni Lenâpè; a change equal to effacing the landmarks of the island as known to paleolithic man; a change that meant so much as the freshening of the

¹ Arch. Explor. Del. Valley, 1894, p. 6. Ginn & Co., Boston, Mass.

river water, and failure of the brackish water of the bay from reaching so far inland, for bones of marine mammalia have been found in the gravel.

It would be a comfort to feel as confident in dealing with some supposed evidences of man's antiquity as we well may be in dealing with that now established fact. Ancient man known to have been here thousands of years ago, there is a tendency to refer to him as the author of certain objects that Nature alone may have had a hand in fashioning. It is marvelous what strange shapes pebbles may acquire, after a few centuries of hanging about rocks and then being smoothed and made less angular by contact with sharp sand constantly in motion. From a large series of such unusual forms, there may occasionally be selected two or three that are very suggestive of other than a natural origin. These are those multi-faceted water-worn pebbles that in general outline are of an implement-suggesting shape, and if the separate facets were defined by sharp edges, as in a spear-head, then the artificial origin of the object would never be questioned.

If, as it seems to me, this is a warrantable assumption, then we have in the present bed of the river, and it matters not where they came from, the ordinary artifact of paleolithic character reduced to a water-worn pebble, but with its original (artificial ?) condition not wholly effaced. This might not have been of much significance, considering all other evidences of man's antiquity, but it is a curious coincidence that after forty years of collecting and of familiarity with many large collections made by others, I have never seen a distinctly worn Indian relic, although thousands of the artifacts attributable to the Lenâpè have been found in the beds of streams, and the flat, notched pebbles, known as "net-sinkers," from the river have no trace of water action on their chipped surfaces, yet the most recent of them are more than two hundred years old.

Neither illustration or description is of much value in an instance of this kind. The object must be held in the hand and then its history is unfolded. Simply a water-worn pebble now, one of millions that, to the untrained eye, varies in nothing from them, but restored as has been suggested, how eloquent of the past! The ancient river flowing between forests of Nature's fashioning; its banks resounding to the cries of wild life; its waters shadowed by flights of fowl; its shallows teeming with glittering fishes; its depths concealing strange and savage forms, and man, yet as wild as the beasts with which he lives. A pebble now, but, it may be, a weapon then with which he was armed to defend himself or wherewith to slay the creatures upon which he fed.

Extreme caution may hold back many from so bold a flight of the imagination, but such a vision of the past is his, who, not rash, but rational, sees what has been as a necessary condition forerunning that which is. The geologist cannot see fossils merely as petrifications. He realizes that these stones were once alive, and so may the archæologist look upon what we may call fossil weapons as once the actual possession of a living man.

It is not to be overlooked that not all flood-plains are surfaced with a flood-plain deposit, for here in the Delaware Valley, this flood-plain, at various points in its tidal flow, consists of a deposit of coarse material, occasionally overflowed, that no flood in historic times could have transported to its present position. The periods of its submergence are of short duration and at protracted intervals, so that vegetation has abundant opportunity to secure a firm roothold. If the water of any freshet is very muddy, as does not always prove to be the case, a thin film of loamy sand is deposited, but succeeding rains carry much of this away and in areas of many acres, like much of Penn's Manor, opposite

the New Jersey shore between Trenton and Bordentown, there has not, since the deposition of the pavement-like gravel, been sufficient silt accumulated to wholly conceal the pebbles, small boulders and coarse sand. Now, an artifact found here, if showing the same surface characteristics as the associated pebbles, is far more likely to be of equal antiquity and not a modern or Indian implement because found on the *surface* of the flood-plain of the river. It requires something more than the mere presence of water to account for the condition of the area over which that water is to spread. When a freshet occurs and the volume of water vastly increased, the material in the present bed of the river may be somewhat disturbed, but no freshet in the memory of man has ever lifted a pebble and floated it inland. To add to the pebble deposit of any flood-plain, here, it would be necessary to lift a stone weighing from one to five pounds at least ten feet and carry it fifty to a hundred yards before it dropped to the ground. This happens to some light substances, perhaps, as anthracite ashes or a bit of fossil coral, but not to any of the pebbles derived from the rocks in place far up the river valley. Muddy water, here, means nothing, considering the effect of rains and of wind when the surface becomes dry again. Where there is a recent deposit due to excessive flow of turbid water, it is always of such material as declares its origin and cannot deceive, and so is really not a significant factor of the ordinary flood-plain. So, it is true, one "need not consider them * * * except to say that anything disclosed in that field clearly belongs to the modern Indian epoch" and as unnecessary as it is true, for no one ever finds Indian relics in mud unless it is so old that it is indurated and as much a part of the flood-plain here as are the pebbles.

Whatever may be true of rivers elsewhere, it is certain that the Delaware has been reasonably methodical through-

out its career up to the date of the appearance of the European settler, when Nature resigned her charge and let the river become commonplace and it has tended only in that direction since that day. The flood-plain of the present Delaware is the ancient bed of the pre-historic river, when its waters were equal to continuously covering the area that is now subject to overflow at long intervals; and when it was the bottom of a wide, lake-like expanse of water, it might readily be that an ancient artifact was, occasionally, dropped from the hand of its pre-historic owner, while he was floating upon or wading in this old-time river.

An illustration of the possible respectable antiquity of objects of artificial origin associated with a flood-plain is the occurrence of a series of net-sinkers or notched, flat, oval or quadrangular, pebbles that have been left, after the net rotted and are now firmly embedded among drift-pebbles. Such a discovery is by no means uncommon, and yet these adjuncts of a net are found not on the edge of the present stream, but at a suggestive distance from it, and, be it noted, there is no more distinctly Indian implement than these flat, notched pebbles. Their occurrence in numbers suggestive of a net means the owner was fishing here and lost or abandoned the net when the water covered the area to such a depth and for such a length of time as made fishing worth the while. But why not that the net was carried inland and left at some wigwam site? If so, where are the other evidences of such site, the tell-tale charcoal especially? I have found many a dozen such net-sinkers on village sites and many hundreds in the water or on flood-plains where the water has been. It may be a case of "not proven," but when considered with abundant other evidence, it is more suggestive of antiquity than of a comparatively recent occurrence.

No flood since 1680, when our records begin,¹ has made fishing over a flood-plain practicable, and for how long a time before this the Indians were fishermen where the land now is dry, can never be determined. As the material, as a whole, that constitutes the periodically submerged area is not to be distinguished from the glacial deposits next adjoining, to assert that all objects found in this area are recent or of unascertainable age, is simply absurd. Because subject to overflow, it no more affects a compacted deposit of gravel than it does a ledge of rock in its proper place. In a narrow gorge, tumultuous waters may play havoc with Nature's orderly array, but not so on such a level, open space as the tidal flood-plain of the Delaware river.

Flood-plains are not necessarily geologically recent, but suppose those of this river are so, they may be archæologically old and can rightly boast an age that should command respect. Geologists may sniff at a thousand years as millionaires do at a nickel, but a nickel may mean a good deal at times, especially when you do not possess one.

A flood-plain feature of the Delaware Valley that is of much interest in connection with the question of the antiquity of the traces of early man here, is that of such sheltered coves as were and are overflowed at times, after their protracted and continued period of submergence. In such, the flow of the water was always sluggish as compared with that of the unobstructed and much deeper channel. These coves are now meadows, sustaining a rank vegetation and vigorous tree-growth. The soil is a black, compact alluvial deposit, separable into fine sand, a small percentage of clay and a large proportion of decomposed vegetable matter. The deposit varies from three to five feet in thickness.

¹ Letters of Mahlon Stacy: Smith's History of N. J., Burlington, N. J., 1765, p. III.

It is reasonable to suppose that when the volume of water of the river decreased until only the present channel was filled and the former bottom of the lake-like expansion was laid bare, that traces of early man would be found thereon, did man exist at that time. It has never been my good fortune to discover any such traces, but in the stiff black meadow mud itself, at all depths, traces, referable to the Indian and his supposed immediate successor, do occur; some of them at such a depth as to indicate that they date back to the beginning of the formation of the alluvium mentioned. How long it had taken this deposit to form is undeterminable, but it must necessarily have been slow, for periods of unusual flow of water would have a tendency to carry off a portion of it, deposited when the conditions were normal. This accumulation of alluvium has been in operation since the meadows became such and subject only to occasional submergence. This accession of material is due to the decomposition of the annual growth of transient vegetation, such as grass, weeds, sedges and foliage of deciduous trees, to which is added the film of mud that a freshet leaves behind it when the water subsides. Such a growth of soil, gradually elevating the surface is extremely slow. In October, 1903, there was, to give an instance, a phenomenal flood. The water was very muddy, and a measurable film of mud was left on favorably exposed surfaces. This, I estimated, after very careful examination of many such "films," as not more than one one-hundred-and-twenty-eighth of an inch. Did such a deposit occur annually and suffer no loss from rain-wash or wind, it would require 1,536 years to build up a foot of deposit, but allow but one-third of this deposit to be mud due to freshets and two-thirds decomposition of vegetation, it would require 4,608 years to bring the deposit to its average thickness of three feet. But the increase is not uniform and it is safe to con-

clude that at least one-third of the material that goes to make the meadow soil is lost.

One such meadow tract of about one thousand acres, with which I have been long familiar, is traversed by a considerable creek and has innumerable springs, and the water flowing from the one and trickling from the others carry something from the ground immediately about them, and the creek was a much more considerable stream in Colonial days, being then navigable. Now it is almost obliterated. Also, the forest growth must not be overlooked, for there were in times past trees of enormous girth that grew upon the knolls, and one generation after another of shell-bark hickories (*Hicoria ovata*) flourished here, and it is a long-lived species. The knolls upon which these trees grew are not the remaining vestiges of islands about which the prehistoric river flowed, but indicate the general level of the meadow at an earlier time, and the earth about them has been washed away by occasional floods, but more by the steady flow of rivulets that originate at the base of the highlands hard by and find their way to the main drainage creek and to the river.

All things considered, this "modern" meadow, this unconsidered flood-plain, is old archaeologically, if not geologically, if a goodly show of centuries is a recognized asset, for through it are found artifacts, largely of patterns ascribable to the Lénâpè, but deeper than the grass roots are scattered objects of argillite of specialized forms.

It cannot fairly be assumed that all objects of human origin in this meadow turf are intrusive. It is not a penetrable soil, but decidedly compact. We have, I submit, therefore, a further evidence that, because a flood-plain, the artifacts embedded therein are not a negligible quantity from an archaeologist's, or even a geologist's, point of view.

No adequate impression of the pre-historic river can be

had without consideration, also, of its several inflowing creeks, especially as the volume of water is very considerable. On the New Jersey side of the river there are many such streams, of which but four out of more than a dozen will be considered, for while all have been visited, but the four uppermost have been closely studied, and what applies to them is applicable in a general way to all. The creeks to which reference has been made are the Assunpink, entering the river at the "ffalles," or head of tide-water, and the only one not affected by it; Crosswicks Creek, Assiscunk Creek, and the Rancocus. These are tide-water streams for several terminal miles of their length. These four streams may well be called "Indian rivers." Their valleys still bear witness not only to a prolonged occupation by the red-man, but of a populous community. Probably nothing so emphatically denies the modernity of the Indian and paucity of his numbers as a careful, exhaustive, unbiased examination of the valleys of these streams. The north bank particularly requires the closest inspection, because these streams flowing from their sources, westward, gives the north bank a southern exposure, and therefore greater warmth in winter, which is much more than an offset to the greater heat in summer.

Looking over only the newly-ploughed fields of the two sides of these creeks, I have found over four hundred artifacts in the course of a forenoon on the north shore and only twenty on the opposite ground, and at the same time innumerable potsherds on the north shore and not a trace of pottery opposite. In some valleys, or sections of a valley, for these streams all have a tortuous course, naturally other considerations govern the location of the wigwams, but no site selected that I have discovered had not protection from the storms of winter.

It is difficult to judge of the conditions when the country was heavily forested, but at present many an attractive glade that to us seems ideal as a dwelling site, yields no trace of its having been occupied, even temporarily, by an Indian family. Much was required besides shelter from inclement weather.¹ A sandy, absorbent soil, water, and, if possible, sufficient water to float a canoe, was desired. There is abundant evidence to substantiate the belief that the Lenni Lenâpè depended more upon navigable water than a wilderness, however easily traversed, for any considerable distance from a watercourse now means a comparative absence of aboriginal artifacts.

The Assunpink Creek, *i. e.* Stony Creek, is wholly within the area of the Trenton gravel and the much older, pre-glacial Columbia gravel and sand formation, and affords comparatively little that has a bearing on the question of the duration of occupancy of its watershed, so far as the Indian or his immediate predecessor is concerned. Both the artifacts of the Indian, jasper and quartz implements and pottery, and the ruder argillite objects, are abundant, but so far as the present surface of the region is concerned there is little that indicates that a line betwixt the two elsewhere-demonstrated occupations can be drawn. Occasionally extensive excavations have told a different story, but these need not here be considered.

It is otherwise with the valleys, drainage areas or watersheds of Crosswicks Creek, the Assiscunk and Rancocas river. Here all the conditions are materially different. These streams flow through sandy areas. There is no rock to keep measurably permanent the banks, and not much

¹ There is a tradition still current that the Indians dwelling some thirty or forty miles northward annually migrated to South Jersey to escape the rigors of the winter; the coniferous forest being noticeably warmer than the deciduous forest of the highlands northward.

resistant clay. It is safe to infer that since the deforesting of the adjacent territory these streams have been materially altered by freshets, and are now wider and in places shallower than when hemmed in by the one-time dense coniferous forests for much of their course and by a no less vigorous deciduous forest, in its tidal reach, as the river was approached.

From their outlets at the Delaware, as far as their sources, miles inland, these streams are dotted with still readily recognized vestiges of Indian villages. Charcoal, pot-sherds, broken flints, maize mills, and fragments of artifacts of obscure significance are abundant, and so frequent are these traces of dwelling places that it may be held that the creek sides were an almost unbroken settlement, where permanently swampy conditions did not obtain, but they did not extend far back from the stream, unless in the little valleys of inflowing brooks. The relics are those of the Indian, but not necessarily of the "historic" Indian. A distinction should be drawn. As I pointed out, years ago¹, "when a considerable collection of the stone and bone handiwork of the Delaware Indians had been brought together, and with this material before us, we picture to ourselves the people in possession of the country when first visited by the Dutch and Swedes, and afterward by the English, the thought arises that considerable importance must be given to a chance remark of Peter Kalm, who spent the winter of 1748-49 in New Jersey, to wit: 'At the arrival of the Swedes in this country, and long after that time, it was *filled* with Indians. But as the Europeans proceeded to cultivate the land, the Indians sold their land, and went further into the country. But in reality few of the Indians really left the country in this manner; most of

¹ Popular Science Monthly, Sept., 1892, p. 586.

them ended their days before, either by wars among themselves, or by small-pox, a disease which the Indians were unacquainted with before their commerce with the Europeans, and which since that time has killed incredible numbers of them.' Again, our author states, 'The Indians formerly, and about the time of the first settling of the Swedes, were more industrious and laborious *in every branch of the business* than they are now.' In other words, they were not known at their best, even by those who had earliest opportunities of observing them, and what they habitually used and constantly produced, perhaps, but a century or two before the advent of the European, was far superior to their cleverest handiwork in the seventeenth century. The English settler had to do with a diseased, discouraged and disappearing people. It is not hazardous to assert that history, as pertaining to the Delaware valley, would have been widely different had the Europeans been forced to deal, not with the Lenni Lenâpè as they then were, but as they had been. True, there were statesmen still among them; intellects equal to any with which they had to cope, but the spirit that once seems to have animated the whole nation was broken. The Indians of the seventeenth century were living on the memory of departed glory."

Their cleverest art-work and finest examples of their flint chipping and pottery, as found in these valleys of affluents of the Delaware, were that of the Indian as his best, which was prior, by centuries, to the advent of the European, for no early visitor seems to have seen such handiwork or refer to these people as really artistically inclined.

As a whole, the "Indian" features of these creeks do not vary from those at the site of the Lenâpèan metropolis, at the "ffalles" of the Delaware; but these creek valleys have one archæological feature in common that is even more

pronounced than farther up the river, the evidence of a people who practically depended upon argillite for their chipped implements. Abundant as are argillite points and knives at the head of tidewater, where they occur by the hundreds, they are found in these tidal creek valleys by the thousands. As a result of changes of the surface, due to deforesting and subsequent cultivation, there is much intermingling now of this argillite with artifacts of silicious stone and with pottery, but at points where the sand is still intact, as in ages ago, there occur such great numbers of these argillite objects and often caches of them, and these never associated with jasper and quartz or pottery, that it is best explained by these objects being the handicraft of a pre-Indian people. These distinctly argillite areas are farther inland than the unquestionable Indian wigwam sites, in many places, and the territory as a whole suggests that these argillite folk preceded the flint folk, and lived farther back from the stream, or was the stream then much wider than now, and so they were literally creek-side dwellers?

This is a question more readily asked than answered, but it is an absolute certainty that the separation of these objects, as pointed out, better explains the conditions obtaining over the whole area, rather than to call all traces of early man "Indian" and, inferentially, devoid of all archaeological significance.

For my part, I have the conviction borne into me that very much of this argillite antedates the days of arboreal vegetation. We are now dealing with a region that was unaffected by glacial conditions, unless the climate was here decidedly cooler than now, and which was sparsely covered with vegetation as compared with a later day. It is not impossible that the ancient "argillite" man was a dweller on the shores of these little rivers, just as he preceded the Indian near the head of tidewater in the Delaware, as his more

deeply buried objects have demonstrated to many who have critically surveyed the region.

So far as I have examined the conditions governing the small streams that flow in the opposite direction or directly into the ocean, they are the same as to the distribution of argillite and flint, but the physical conditions of the immediate coastal plain are very different from the corresponding area adjacent to the river. There are, however, near the ocean, areas where argillite occurs exclusively and with no trace of pottery. This fact, of itself, convinces me that these argillite objects are significantly older than the handiwork of the jasper-clipping Indian, for I have never failed to find pottery wherever jasper and quartz implements occur. It is very suggestive, too, that many of the argillite artifacts found near the seacoast have undergone a degree of weathering that is not so often seen in gatherings of similar forms from the western or river side of the State. Remarking on the absence of these argillite relics, in a large collection of Indian artifacts, from the immediate vicinity of Atlantic City, I was informed that they were abundant "in spots," but so weathered they were not valued, and, therefore, gathered, and were referred to, contemptuously, as "rotten arrow-heads." The attitude of the collector proved more valuable to me than any number of specimens.

Having pointed out the more salient features of the present river and its tributaries, and suggested, if not demonstrated, what were the main conditions obtaining in anciently pre-historic time, we are brought to consider that most interesting event—the arrival in the valley of the Delaware of the Lenni Lenâpè. Here Heckewelder is the only author who can help us. He asserts on the basis of a tradition that the Lenni Lenâpè were at one time a western people that gradually (or part of them) migrated eastward, reaching first, of large rivers east of the mountains, the Susquehanna.

The story runs thus:¹ “The Lenni Lenâpè (according to the traditions handed down to them by their ancestors) residing many hundred years ago in a very distant country in the western part of the American continent. For some reason, which I do not find accounted for, they determined on migrating to the eastward, and accordingly set out together in a body. * * * The spies which the Lenâpè had sent forward for the purpose of reconnoitering had long before their arrival discovered that the country east of the Mississippi was inhabited by a very powerful nation. * * * Those people (as I was told) called themselves Talligeu or Talligewi.”

The eastward passage being disputed by the occupants of the territory invaded, “great battles were fought,” and the outcome was “that the Allegewi, at last finding their destruction was inevitable if they persisted in their obstinacy, abandoned the country to the conquerors * * * the Lenâpè took possession of the country to the south. For a long period of time—some say many hundred years—the two nations (Lenâpè and Iroquois) resided peaceably in this country and increased very fast; some of their most enterprising hunters and warriors crossed the great swamps, and falling on streams running to the eastward, followed them down to the great Bay river, thence into the Bay itself, which we call Chesapeake. As they pursued their travels, partly by land and partly by water, sometimes near and at other times on the great Salt-water Lake, as they call the sea, they discovered the great river which we call the Delaware; and thence exploring eastward, the Scheyichbi country, now named New Jersey, they arrived at another great stream, that which we call the Hudson, or North river. * * *

¹ Quoted by Brinton in “Lenâpè and Their Legends,” p. —. Philadelphia, 1885.

"At last they settled on the four great rivers (which we call Delaware, Hudson, Susquehannah, Potomack), making the Delaware, to which they gave the name of Lenâpè wihittuck (the river or stream of the Lenâpè), the centre of their possessions."

This rather mysterious folk, the Allegewi, Tsá-laki, or Cherokee as we now know them, were not occupying a region at the time of the migration that suggests that the valley of the Delaware was in the scope of their possessions, but one materially westward of it. The present Scheyichbi (New Jersey) may have been a *terra incognita* to the Allegewi, and as the record runs, was untrod by the foot of man since the closing days of glacial activity until re-discovered by the Lenni Lenâpè. But, taken as a whole, this tradition does not debar the possibility of the remote ancestry of the Allegewi from having reached the Delaware Valley from some southern point and left behind them these partly decayed and very old argillite objects that now are characteristic of the region in certain portions thereof.

We would be venturing necessarily on uncertain ground in attempting to unite that which is remotely pre-historic with what is distinctly historic, but as we can only deal with time relative and not time absolute, it is not contrary to such facts as we possess to look upon the Lenâpè as pre-historic actually, if not to the same degree as the people who appear to have preceded them in the Valley of the Delaware.

We are brought then to consider the simple question of whether what is now New Jersey was without inhabitants at the time of the arrival of the Lenâpè, or was the territory populated? It seems to me highly improbable that the tradition as preserved by the Lenâpè and secured to us by Heckewelder should have omitted all reference to the argillite people, as I have ventured to designate them, had

they been in possession of the river valley when first sighted by the Lenâpè.

A migratory movement on the part of a people, men, women and children, is never akin to the onward march of an invading army, with a definite purpose in view. Then time is everything; but with these Lenâpè, with no fixed plan, but yielding to a spirit of restlessness and love of adventure, time meant nothing. How long these people were "on the move" it is impossible to determine, and how long a tradition can be handed down without losing all traces of accuracy is an open question, but the Lenâpè, treating of the past, used no definite phrases. Their past was quickly chaotic, and so the best that we can do is to sum up their expressions of that which has happened with: "Once upon a time," as fairy tales begin.

It may be some prophet (no other people could boast of better) had declared the land of the rising sun to be a happier hunting ground than any they had known, and the dateless Lenâpèan hegira began, and here where the ocean forbade further progress, it ended. Here, too, certain changes were effected of a character that meant not a few years, but many.

As recorded by Heckewelder: "Those of the Delawares who fixed their abodes on the shores of the Atlantic—including the Delaware valley—divided themselves into three tribes. Two of them, distinguished by the names of the *Turtle* and *Turkey* * * * chose those grounds to settle on which lay nearest to the sea. As they multiplied their settlements extended from the Mohicanittuck * * * to the Potomack." * * * The third tribe, the *Wolf*, * * * had chosen to live back of the other two."¹

This, in brief, is what we know positively of the Lenni

¹ Heckewelder, I. c., p. 143. From Brinton.

Lenâpè, and it admirably agrees with what their relics tell us, and as we now find them scattered over the surface of the country. This people were here long enough to effect such a change as that of tribal division, and, what it appears to me after many years of observation is unquestionable, they improved greatly in their skill in implement fabrication. A rude and an elaborately chipped object of the same pattern mean nothing as we find them side by side on a newly-ploughed field, but gather, as I have done, tens of thousands of such objects under infinitely varied circumstances and the rude and the elaborate tell another story.

The Dutch, the Swedes, and finally the English, on their arrival changed the complexion of affairs. The pre-historic river became historic, and the earlier condition of its valley was gradually dissipated by the axe and plough and settlements of the Europeans. But it is not difficult to see what had been if we are not too occupied with the mere collecting of objects. This is not the most important feature of archæological exploration. Nature had ruled with undisputed sway for incalculable ages. Primitive man was not destructive in the sense that we are. Whether or not the Lenni Lenâpè were invaders here because of another people occupying the valley at the time, or found it uninhabited, is a problem so far that eludes our grasp; but that it had been, if not then, inhabited, is, I hold, apparent, if the traces of early man still remaining can be accepted as a guide. It is universally accepted that chipped pebbles in the deep-lying gravels are indicative of glacial man, and unquestioned artifacts of a later period are not rejected as evidence of man, but of what period? Were they as recent as the Lenâpè or point to the prolonged occupancy of the region by a fore-running people?

Leaving now the pre-historic river and its immediate shores, let us consider, in the next chapter, those ruder traces

of early man, widely specialized as they are, that we find throughout that area which we call the upland fields; fields that were forests when the river was hemmed in by wooded banks and its waters were disturbed only by the myriad forms of wild life, and it may be, the rude craft that carried the pre-historic hunter.

CHAPTER III.

A PRE-LENÂPÈAN PEOPLE.

IT HAS been suggested seriously that all surface-found relics of a people earlier than ourselves should be ruled out of court because of the unfortunate circumstances of having been prematurely unearthed. This attitude, distinctly academic, if not orthodox, has at least one merit: It indicates that the relic came from somewhere, and had not always been lying exposed to the light of day and the vicissitudes of summer's heat and winter's frost. It came from somewhere, a locality not easily defined and charted on no map; but not so great is the difficulty as might be supposed. To say "I don't know" is too often tacit acknowledgment of inability to acquire knowledge. Where could a weather-worn, half-decayed, rudely-shaped argillite knife or arrow-point, for example, come from, if not from the ground? It did not fall from some passing cloud. It was not shot from illimitable space, as are meteorites. It was not blown hither by some over-sea or over-land tornado. It did not result as the fruit of a concatenation of circumstance, such as physicists wot not cf. So it is that we are left to the sole alternative of concluding that it came up out of the ground, and how much that little word "up" means in such a case. Surface-found relics do have a value, and the High Priest and petty priestlets in their Sanhedrim gatherings should not be so severe. If they tempered their decisions with more thought of logical conclusion, and less of their personal importance, the wayfaring man, though a fool, would be wiser.

It must be remembered that a sandy soil is more or less an unstable one. Here, in this part of Lenâpè Land, at all events, were it not for the quick growth of weeds, when it is exposed to the sun and rain, that hold it back, the change of surface would be very rapid and the underlying clays and coarse gravel would, in many places, be exposed. Where fields are now slightly undulating, when forest-clad, they were up-hill and down-dale to a far greater degree. This is shown by acres of woodland that have been cleared in recent years and were familiar to the writer, both before and since deforestation. In their natural or forested condition these acres were a long series of hills and hollows, none very pronounced, but not to be overlooked. However dry and sandy the "hills" might be, the "hollows" were either with a pool of water that never entirely disappeared or the depression, as a whole, was a miniature swamp. Denuded of tree-growth, these originally uneven surfaces become more nearly level and are uniformly dry when under cultivation. Old deeds and other ancient documents refer to conditions of which, now, no trace remains. The English settlers who came here in 1675-80 would not now recognize any of the present features of the land they "took up" on their arrival. The single distinction of up-land and meadow alone remains. It is not strange then that the argillite artifact and the jasper implement should now be associated, and if we had no means of determining the original condition, to draw any distinction between them as to their archæological significance would be a hopeless task.

It is easy to see how objects that have been exposed to the washing of the soil, even by ordinary rains, and much more so by the effects of an occasional torrential downpour, should be brought to the newly-created surface in this way. They are either simply uncovered, or, it may

happen that they are in the course of a temporary rivulet, which carries or rolls them to a considerable distance. This, of course, happening only where the ground slopes. In just this manner I have known round pebbles to be rolled to the edge of a permanent brook, and so were speeded well on their way, to be carried by the next flood far down the brook, and perhaps to the meadows and the river level. The ordinary operations in the tilling of the fields tends to cover and uncover and mingle objects that are on the surface with those underneath, or those left by the Indian and now in the soil, and other objects, in the sand beneath, which the Indian never saw. In a sandy field, a little gully, a foot or eighteen inches deep may be the result of a single rain, and objects may fall or be washed therein, and so become buried by the obliterating plough that removes all traces of such temporary channel of a rain-fall stream.

Assuming that argillite artifacts are characteristic of the "yellow drift" as it has been called¹, it must be remembered that this "yellow drift" is but a few inches below what we call the soil, or that surface which is discolored by decayed vegetation and sustains the growth of grass and minor weeds. The two "deposits" cannot escape being intimately associated. It is a matter of color rather than constitution and in endless ways all lines of demarcation are likely to be obliterated, and so, obviously, small objects such as flakes of stone and artifacts not larger than average arrowpoints would be brought together. This ground for the most part has been vigorously stirred for two centuries, yet evidences of a certain sequence have not been destroyed. Like pottery, not all the pieces of a vessel are necessary for us to reconstruct the vessel. We can tell with certainty what has

¹ Archaeology of the Delaware Valley, by Ernest Volk, p. 84; Papers of Peabody Museum, Vol. V., Cambridge, Mass., 1911.

been, from what is. Were it not so, archaeology would be a waste of time.

Here a word as to the conditions obtaining with regard to the ordinary Indian implements. They are distinctly a feature of the surface. They are turned up and turned down by the plough, and in the two centuries, and more, since cultivation of the land began, they have been inhumed and unearthed yearly, till it is a wonder they have not been broken beyond recognition. When they do occur at some unusual depth, their deep inhumation can be readily explained. The earth itself always shows evidence of accidental or intentional disturbance. It may be pertinently asked: Why, in the course of centuries, has not the handiwork of the Indian gotten deeper into the soil? Why have not the operations of earthworms buried them; and burrowing animals and the uprooting of trees led to their reaching greater depths than the present average of less than twelve inches? It may be well, here, to attempt a reply by asking a question: What were the precise conditions when the object was lost? It fell on moss or grass, and, as this decayed, sank into the dust that formed. The wind carries other dust and fine sand and rain brings coarser sand and soil and traces of clay, and in time the object is covered. Years pass and slowly but steadily the soil accumulates. The one-time relic, lying exposed upon the surface of the ground, becomes embedded in it. The annual fall of forest leaves add to the soil a modicum of dust, for the accumulation of a century turned to powder makes but a thin film of mould. Who shall say how long the leaves were making soil before the devastating European came upon the scene? So, may not many a possession of the migrating Lenâpè have been a "relic" to the later Lenâpè, who knew of his "grandfathers" only through tradition? We cannot ignore the possibilities in investiga-

tions of this kind. We cannot hope to draw aside the veil that shuts in the past, but the mind can image that which is behind it by close scrutiny of that which is before. What Nature is now doing, she was doing in the ages that have passed.

Then comes a change. The trees are felled, the ground exposed to the direct action of frost and rain. The surface of the ground is stirred and overturned. We have seen how this surface suffers where unprotected. The relic that for centuries, it may be, was lying in one spot, and in all that time only covered to a depth of a few inches, is now exposed again. Our soil, as we see it and walk over it, is not the soil that was pressed only by the moccasined foot of the Lenâpè. That soil was washed away years ago. We call the Indian relics of to-day a feature of the surface soil, but that does not mean they have had no other history. Still, with all the aid of a rightly-used imagination, this is a difficult subject to handle, as the field archæologist knows to his sorrow. Of course, all is readily made plain in the library or in conclaves of savants, but—suffice it here to state that Indian relics, jasper and quartz spear-heads and arrow-points, axes, celts, agricultural implements, pipes, amulets and ornaments are all still on the surface. Would they not be beneath it if Nature had still her own, and the forest flourished as of yore? I think so. As it is, we give the soil no chance to grow, and so relics of our own colonial period are mingled with those of the Indian, instead of slightly above them.

So far as my own observation extends, when a woodland is cleared, if any relics are found they are distinctly a feature of what we consider the surface. They show all the effects of their embedding that characterize the pebbles, and none of the features of the surfaces of stones from the deeper sands. There is no distinct patina such as forms

on flint, but a condition of surface that is readily recognized by the initiated; a condition that is annihilated when specimens fall into the hands of the collector and are cleaned. The adherent dirt is often as valuable to the archaeologist as the object itself.

It must not be supposed that traces of the Indian are equally distributed. They occur where Indians dwelt, and were left or lost on ground that they had cleared and cultivated. Beyond these limits their occurrence is accidental. This fact does not make for the recent origin of the Lenni Lenâpè in this region, but indicates how very slowly Nature operates in the matter of inhumation. Where vegetation has protected the surface from rain-wash, the soil has remained in *statu quo*, beyond its slight centennial increase. A monument set by a surveyor in 1700 stands precisely as it did when erected. The soil has not accumulated about its base to any noticeable degree. The same is true of our colonial cemeteries. Stones set two centuries ago have not sunk, or rather had soil accumulate about them, until it encroached upon the lettering, which, at first, was only a foot or less above the ground. The uplifting by frost and settling when frost disappears seems to have had no effect, and certainly in such an instance as this we have some guide to conclusions as to the career of stone implements left, centuries ago, on the surface. Nature is so deliberate, even when handling her shifting sands, that it will need millenniums to so bury the artifact of the redman that it will occur only, hereafter, in deep excavations.

More to the purpose, perhaps, is the wigwam site occasionally brought to light. Here it is not so much the objects found as the condition of the soil. It is compact, discolored, mixed with charcoal dust and sometimes baked in places. I have sometimes found the fire-place well defined. A few fire-cracked stones of uniform size are still in posi-

tion, as if the fire was still burning and they had been so arranged as to prevent its spreading. Such a fire-place or wigwam site now is never on the actual surface, but not far from it. Unquestionably the last cooking-site, village fires and camp-fires of the Indians were destroyed by the European settlers and only those are found which were old, abandoned and concealed during the close of the Indians' career. It is a liberal estimate to give to the surface soil, the "black soil," an average depth of twelve inches. This it has been for many years. At the time of deforesting it undoubtedly was greater and far less compact. It is safe to assert that Nature has not inhumed the relics of the Indians to the depth of twelve inches, measuring from the surface, except incidentally and accidentally, and man's violent disturbance of the surface has not affected such a change as might be expected. The handiwork of the Indian is still a distinctly surface feature of our ordinary fields. A mere scratching of the ground is all that is necessary to bring them to light.

The above remarks, of course, apply only to the uplands. In the meadows that constitute the present flood-plain of the river there is a wholly different set of conditions. Here the deposits, at irregular intervals, of mud from the waters of freshets is to be considered. Soil is accumulated more rapidly than on the uplands, but not so rapidly as to modernize traces of man found in it. Nature unbuilds as well as upbuilds, and the current of receding waters may carry away as much or even more than it brought. The gain is not uniform, such as a fraction of an inch to every flood, but there is a gain, year in and year out, as the deposit constituting the surface soil of the meadows now shows. The Indians loved the spot, as the abundance of relics shows, and braved the occasional high water that must have put them to much inconvenience, but such occurrences were probably less common than now, for the evidence all goes

to show that the village or wigwam sites were permanent, as permanency of occupation was looked upon by these people.

On removing the soil of the upland fields we find that it rests ordinarily upon a thick stratum of sand of uniform color, and examined closely is found to be not materially unlike the "body" of the surface soil when washed until free of all trace of vegetation. We have now to deal with this underlying sand as a distinct archaeological horizon, or as one having nothing in common with the soil above it. Let us suppose that the soil and the sand beneath it were converted into sandstones; the lower lighter in color and with but a few traces of organic remains and the upper one black and heavily charged with fossils. By a paleontologist the differences would be recognized at a glance, and the two "rocks" referred to an earlier and later horizon, and the differences would be more marked than is often the case with Eocene and Miocene formations and decidedly better defined than is the merging of the Pleistocene, the Quaternary and the recent. In the case of our supposed sandstones the "fossils" will be a rather abrupt transition from extreme simplicity to pronounced complexity. In the lower, light-colored "sandstone" these "fossils" will consist of ninety per cent. argillite chips¹ and some few specialized imple-

¹ Examples of these "chips" of argillite, taken from suggestive depths in the "yellow drift," were submitted to Profs. Putnam and Woodworth, of Harvard University, and were pronounced "natural" or flakes due to frost action. In this I do not agree. The frost-detached flakes have not such shapes, and show they have been detached along the lines of least resistance, but these sand-embedded flakes are detached across such lines, showing they are due to percussion. It must be remembered, too, that there are no argillite boulders in the Columbia Gravel, and as these "yellow-drift" chips are derived from such boulders, now *on* the Columbia Gravel area, even if detached by frost, hark back to the artificial agency that located the parent blocks. A fragment of a stone which man had once laid his hand upon is as much a "relic" of man as the most elaborate artifact.

ments of the simplest types. With them will be shells of both fresh-water and marine species, and noticeably, both water-worn and sand-polished pebbles. This lower horizon will also show variation in its structure and give evidence of different agencies operating in the laying down of the sand.

Examination of the upper layer or horizon shows at once far different conditions have operated to effect its formation. For wide areas there is little to be seen but sand and shapeless organic matter, but this all changes in circumscribed localities where "fossils," almost as abundant as shells are crowded in some cretaceous marls; and these "fossils" are not such as we found in the older, underlying deposit. The material is not the same to the same extent. The percentage of argillite is but ten per cent. of the whole, while jasper, quartz, chert and other silicious mineral makes up the ninety per cent. In the earlier sand specific variation was very limited, but in the later sand (*i. e.*, the soil) there is not only a wide range of "specific," but of "generic" variation. The transition has been from a low and extremely simple form to that of a high and very complex one. It is not an instance of evolution, slow, halting and uncertain, but of abrupt succession. The conditions corroborate the Lenâpè tradition and contradicts the suggestion—insistence of some ethnologists—that the Lenâpè was the argillite man who later became what he was.

In this, our paleontological view of the actual conditions, there has been had under consideration not the ordinary long-tilled fields, where lines have been obliterated and hopeless confusion exists, but those few localities that I have been able to examine where such disturbance of original conditions had not occurred. No geologist would question for a moment my reading of the assumed "rocks," now strata of sand, but the archæologists of to-day, usually

those who have never visited the locality, or those who previously charged their hearts with murder and so gave it but a superficial and biased glance, are now given to criticism and are full of wise saws inapplicable to this instance of archæological plain progress. If these countless millions of grains of sand were cemented nobody would doubt, or could doubt if so inclined, but lacking cementation nobody believes, or until recently, nobody did believe.

We are brought now to consider the origin, and incidentally the age of these sands, practically the same, which have been separated for convenience of study and now known as the surface soil and the "yellow drift." Modesty forbids my going further than venturing a few suggestions. Certainly I have no desire to be dictatorial, but if an opinion is not set forth vigorously it can never gain attention, and probably does not deserve it. There has certainly been no *suaviter in modo* in the treatment of my archæological views, so I feel that in venturing into the geological field I must follow the usual methods of *fortiter in re*.

It has been suggested by some, and confidently asserted by others, that at the close of the maximum activity of glacial floods, when the coarse gravel and many large boulders were transported from the upper Delaware valley—largely derived from the terminal moraine—and deposited here at the inland limit of tidewater, where, because of this tide, the downward flow of the water was effectually checked periodically, that there followed periods of flood when no large boulders were moved, except an occasional one embedded in a still more occasional mass of floating ice, but that sand was still borne hitherward in enormous quantities, and this up-river sand, deposited now above the glacial gravel, is now that "yellow drift," the intrusive or accidental objects in which indicate the presence of man as

long ago as the time of its gradual accumulation. This is strictly in accordance with the ordinary lines of geological procedure and is so far reasonable that it will probably be accepted for a long time to come; but another origin of this same "yellow drift" is to me the more probable, because a far simpler one and with less assumption in it than in the glacial flood explanation of its origin.

A survey of this "yellow drift" shows that it lies at a considerably lower level than the surrounding formation, known as the Columbia Gravel. The former is about fifty feet above the river, while the latter ranges from seventy to one hundred. It is significant, too, that where this "yellow drift" has been scrutinized most closely¹ in the Trenton Gravel area or limit of the tidal flow of the Delaware river, the Columbia Gravel area is drained by creeks that flow directly across the "yellow drift" and on into the river. The river, the "yellow drift" and the Columbia Gravel are like three steps, and just as a marble rolls from the top step to the bottom, so it seems probable that the "yellow drift" was washed from higher ground to where it now is, considering that the washing, or rather transportating, agency existed, as it still does, in the days immediately succeeding glacial activities, and even before them so far as known. There is no one feature of earth history that is so hopelessly out of reach as the date and circumstances of the birth of a watercourse. Suffice it in this case to know that the Columbia Gravel here is, as it indefinitely long has been, drained by creeks, and these now flow through the "yellow drift," having cut an ever-deepening channel until tide-level was reached, but once flowed over it, as before then it had washed the underlying clay and coarse gravel. These creeks are older than any exposed area, except uplifted rocks, in the Trenton Gravel region.

¹ Lalor Field: Arch. Del. Volk, I. c. p. 84.

If this suggestion of derivation is worthy of consideration the "yellow drift" and Columbia Gravel must be the same in general features, the former showing only such difference as the "washing" during transit in the creek waters would bring about. This is true. The "yellow drift" is washed Columbia sand, so far as can be determined by microscope and other means of determining its character and origin. The Columbia Gravel brooks and creeks are even now equal to the task of carrying much sand and surface débris when swollen by heavy rains and in winter, when a warm south rain breaks up the ice, even pebbles as large as pigeons' eggs are carried a considerable distance. This bears the relation to Nature's activities of other days that the laboratory demonstration does to the operations of some great law in the world at large. Geologically we are now in days of littleness, for extremes, as we call them, were the commonplace occurrences of undeterminable centuries ago. The annual rainfall, now some forty and odd inches, was greater then, and so the streams were larger, and this, too, we know to have been the case, because when a cross section is made of the present valley of a little brook there is shown to what extent the present stream has diminished; and in some instances brooks that were once permanent and of considerable volume have wholly disappeared.

One small brook with which I have been familiar all my life is now usually dry in August and September, and yet I have known it to be four or five feet wide and six or eight inches deep for months together, and one cloudburst (August 24, 1877) made of it a river for several hours, about ten feet deep and nearly one hundred feet wide, and in that time, some five or six hours, it loosened from stiff soil large stones weighing ten to twenty pounds and rolled them down a gully its entire length of about five hundred feet and deepened this ravine from three to five feet, removing

all sand and coarse gravel and bringing the bed of the brook down to a stiff, unyielding clay. Now, if such excessive activity as that of one August afternoon was a frequent occurrence some thousands of years ago, or more recently, it is evident that a depressed area like that of the restricted acres of the "yellow drift" might readily be covered with such a material derived from the immediately adjacent territory and the up-river valley not be called upon to supply any deficiency.

This "yellow drift" is not merely an iron-stained sand. There are intrusive objects¹ scattered through it, few indeed, like the raisins in a boarding-house rice pudding, but they are there and have a significance that is not archæologically insignificant. These objects are sand-polished pebbles, water-worn pebbles and shells, so far as my own collecting has resulted. The last, valves of *Unio* and *Mya*, one a fresh-water and the other a marine species. It happens that in the Columbia Gravel area we have streams in which mussels are still found, both *Unio* and *Anodonta*; and when the "yellow drift" was deposited the Delaware river was salt at the head of tide-water, and the recent dredging of the river has demonstrated that *Mya*, *Ostrea* and other marine shells were as distinctly a feature of the fauna then as *Unio*, *Anodonta*, *Limnea*, *Planorbis* and *Goniobasis* are at present. We have, therefore, a source of supply for all objects found in the "yellow drift" near at hand, and some of them could not by any possible means have been brought here from miles up the river. That the pebbles should be both smoothly polished and water-worn is not surprising, as pebbles of both varieties are extremely common on the surface and in the strata of Columbia Gravel.

¹ Intrusive in the sense of having been gradually embedded in the original deposit and brought to present position by some agency that brought the sand, or dropped by man during the gradual accumulation of this "yellow drift."

With these natural objects,—fossils and pebbles,—are certain flakes of argillite and a few undoubted artifacts, some as well defined as any surface-found arrow-point or knife. These at once suggest the association of man with this “yellow drift” in the sense of contemporaneity. So far as my own observation extends, there is not a trace of man in these sands that is not a superabundant feature of the adjacent, far older, and more elevated Columbia Gravel areas. The agency that carried the sand, the shells, pebbles and argillite flakes and artifacts to where we now find them was the same. They could all readily have been transported by water and man might have wandered over these sands, but only occasionally, for the higher ground, with a dense forest and more attractive and habitable, was near at hand. On the other hand, if all we find came from the river valley it should be characteristic of that valley, and this it distinctly is not.

It seems, therefore, unnecessary to look to the floods due to the melting of the one-time glacier that filled the up-river valley for an explanation of this “yellow drift.” If from up the river it should be a sand of a very mixed character and like the present sand that accumulates in such vast quantities in many parts of the river’s channel, but more importantly, we are relieved of the necessity of having the river at this point flowing at a height of more than fifty feet above its present level, which would have inundated thousands of acres and made swamps of many an area that gives every assurance now of having been dry land when the glacial floods were busy with what we call the glacial gravels.

A study of the Columbia Gravel area with reference to the origin of the “yellow drift” is suggestive. Almost any sectional view of the Columbia Gravel will show an excess of pebbles—mostly white opaque quartz—and small oval boulders near the present surface, while beneath it, some two or three feet, they are scattered and often wanting over a

considerable area. The condition likewise suggests that rain-wash has lowered the area of Columbia Gravel by removing the sand and allowing only a sinking to a lower level of the coarser material, and shallow inhumation in the gullies formed by temporary flowing of collected water. In days gone by, when all the surface variations were much more strongly marked, this Columbia Gravel sand was slowly spread over the low-lying areas of older deposits, until the plain was materially nearer to that of the Columbia Gravel, the original plain of which was correspondingly lowered. The chance visitor regards the whole region to-day as a uniform, continuous plain, with but trifling variations of elevation above tide-water, but this is more apparent than real, a condition responsible for most of the world's ignorance. The difference is really considerable, as already stated in approximate figures, and as all these variations are from higher Columbia Gravel to lower "yellow drift," and as the streams that could have affected the changes described are still existent, and now, with every rain, carry away this same Columbia Gravel sand, although no longer spreading it over an upland area, but through the deep gullies these streams have worn into the old surface until the tide-level was reached.¹ Columbia Gravel sands are now lost in the

¹ An interesting instance of this is shown at one point in the valley of Crosswicks Creek. For centuries the "Abbott Spring" (named for my ancestor in 1695), which now supplies Bordentown, N. J., with water, gushed from the base of the bluff facing the channel of the creek, carrying with it a small quantity of sand, which was deposited in the creek and distributed by it as the tide ebbed and flowed. The result was the formation, in its underground passage, of a cave whose walls had no stability such as rock would give it. This under-wash was carried finally to such an extent that the supporting, weakly-cemented sand gave way and the spring was temporarily checked, but burst forth at last and spread many cubic yards of Columbia Gravel sands on the black mud in the bed of the creek, forming an island there. It was, on a small scale, very much of a repetition in a few days of what took place gradually and during centuries, when the "yellow drift" was being spread over such areas as "Lalor Field."

meadows or reach, when the volume of water is much increased, the river.

It is such a sequence of local event that best explains, so it seems to me, the paucity of intrusive or incorporated objects in the "yellow drift," for, while in course of deposition, this "drift" was often exposed, and probably at such intervals traveled over, but not in any sense permanently dwelt upon. Traces of fire, had any ever been built on these sands, would not have been absolutely annihilated, and no trace of fire has yet been detected. It was certainly never forested, but always a natural, treeless meadow adjacent to the Columbia Gravel, as the present low-lying tract along the river is the meadow to the now elevated "yellow drift."

Fortunately there were no eye-witnesses to the activities of the Delaware Valley during the glacial period who recorded what they saw. Had there been we would know less than we do now of the particulars. Nature's own testimony can be taken unreservedly, but that of a man, even an eye-witness, never; although it is hardly fair perhaps to insist, as has been done, that man is the master of misinterpretation.

What the up-river glacier did to the down-river valley will be considered later. Suffice it to remark at this point that did the "yellow drift" bear any direct relation to such activities as those of the Ice Age, it would be, to say the least, but a sorry dénouement of the grand glacial drama.

To describe a problematical people in hypothetical terms is not so easy a task as the layman might suppose. The popular idea that anything "goes" when no one has positive knowledge of the subject is a fallacy. The improbable may pass without challenge, but seldom does the impossible escape detection, and an explanation is demanded.

In the foregoing pages I have frequently and perhaps somewhat vaguely referred to a people who preceded the

Lenni Lenâpè, accepting then and there the suggestion of such a man as an established fact. But what do we really know of him? Painfully little—nothing, according to one school of archaeologists—but that little seems to me quite as satisfactory evidence of this existence as a foot-print indicates the creature that left it behind him. Can we deny the one-time existence of a plant, tree or shrub, when we find the fossil impression of a leaf in clay or slate? Does not the shadow in our path indicate the presence of substance somewhere 'twixt it and the sun! We hear the song of a bird, and though we do not see it, that bird is as much a reality as if it were perched upon our hand. In much the like manner, even when we cannot demonstrate the fact, that the past is never wholly unrepresented in the present. This is one of those truths that are felt by the individual, but beyond his powers to communicate. It is the outcome of a thousand conditions, not of one; the grand finale of endless acts and incidents which no one person has seen in their entirety. To place the outdoor world on a printed page has been an aim of authorship for centuries, and not even Thoreau wholly succeeded. Nature will not suffer an interpreter to intervene. She speaks direct, and it is only when the upland fields of the Columbia Gravel, the lower lands within the limits of the Trenton Gravel, and the flood-plain of the present river are wandered over, with an eye to every possible trace of early man, that the truth slowly dawns upon you. It is only after you have gathered, not a dozen, or a hundred, but thousands of artifacts of an ancient people that it becomes reasonable to draw a distinction betwixt one thing and another and at last, as the fruit of years of observation, are warranted in separating one whole group of objects from another and say these are older than those.

Many the discouraging days, when the supposed results

of one week's or one month's work was completely negatived by some quite unanticipated discovery, but not one of these apparent contradictions but ultimately proved apparent only, and I am now unreservedly willing to champion the cause of that pre-Lenâp  an people, to whom I have been referring more or less pointedly in preceding pages. He may never be real to any of my readers, but he is not only so to me, his discoverer, but as much an actuality as any personal acquaintance. He sticks much closer than any brother. He is in some respects more like a poor relation we cannot get rid of. I am living where this man of the Columbia Gravel lived, and his ghosts seldom let go an opportunity to let me know the fact. His bones are considerate and seldom obtrude upon me, but his artifacts are scattered over every field and I cannot escape them.

Your acquaintance who admits nothing is your *b  te noir* on such occasions. He is insistent where satisfaction is not possible because the evidence is of a character that must be realized by the individual through his personal experience as an arch  eological observer. I cannot make more plain the faith that is in me.

Not long ago I was present at a candy-pulling and one mass of the melted sugar was drawn out to so fine a thread that I could scarcely detect it, yet that thread was as much sugar as the parent mass, and as much a part of the mass as any other portion of it. So it is with the evidence of the pre-Lenâp  an people. Following the fine threads of evidence we find them attached at the other end, not to the surface soil, but to the substantial underlying sands, and are, or ought to be, satisfied. It ought to satisfy even the carping critics, who decline to visit the locality, to know that on and in the Columbia Gravel there are localities where all the handiwork of a people has a "family likeness" running through it, that separates it, at a glance, from the readily recognized handiwork of the historic Indian.

We know too little of the career of the American Mongol, or better, *Homo Americanus*, to be dogmatic. The precise method of his appearance on this continent, and intellectual status at the time, are problems to be solved. How far there was an unfolding of faculties, as the nomad proceeded in any direction from his starting point, has not yet been determined, but this much we do know: no facts have been discovered which promptly put out of court the suggestion that the pre-Lenâp  an chipper of argillite was not an "Indian" comparing fairly well with his Lenâp  an successor. Our older man had no grooved axe, no polished celt, and almost certainly no pottery, but the one material for implements upon which he depended met his several needs, as is shown by the vast quantity of them he left behind him.

These implements, of themselves, however, must not be our sole reliance in the conclusions reached as to their significance. The circumstances under which some of them are found must confirm all other considerations, and the fact that in many instances these circumstances favor a greater antiquity than jasper and quartz implements seems to me to settle the matter forever. No other explanation can be given to such an occurrence as the discovery five feet below the surface, in gray "river sand"—not "yellow drift"—of a group of argillite knives and spears without any trace of pottery or silicious stone of any variety is certainly a telling fact.

Argillite is certainly a disturbing factor in the arch  eology of the Delaware Valley. It is quite as assertive as jasper and quartz, and a great deal more obstinate. No one has ever quarrelled over a jasper arrow-point, but an argillite knife has been known to cut friendship. "It is all Indian," is the war-cry in one camp, and "it's older than Indian," the cry of the opposing army. An innocent expression of opinion on my part, years ago, "set the woods afire," and by the light of the blaze that still flickers, I ask leave to introduce a new

witness, in the illustration, Figure 19, of a group of argillite knives found so deeply in the ground that antiquity is at once



Figure 19.—Group of rude argillite artifacts found beneath an undisturbed deposit of sand.

suggested. But a host of objections are at once raised. I did not find them myself, and how am I to know that the story told of them is true? Let me reply by asking a question, which is always the most effective way. How could a man invent such a story when he did not know what the objects were, and only recognized their peculiarity by being the sole objects beneath a bed of "sharp river sand," as he called it, and no pebbles in sight. If that is not evidence, go over into the modernists' camp and sing "All's Indian" to your heart's content.

'Not one of these eight specimens is in any way peculiar, and can be duplicated on any field where traces of man occur. They are scattered all over the Columbia gravel surfaces and are in the "yellow drift" of a later date, as well as mingled with jasper and quartz on the "black soil" surface, where there has been a breaking up of the original conditions. The single fact remains that deep in the ground they were, and where there had not been at any previous time any disturbance by digging or uprooting of primeval forest or other petty cataclysm upon which the modernists depend for an occasional crumb of comfort. It is, on the other hand, as clear an evidence of man's antiquity as the discovery of his bones in a field a mile or two distant that has been exploited as of unusual interest and forced painful admissions from those who deny man's paleolithicity.

Figure 20 represents a series of those long, narrow, tapering "fish-spears," as they are now called, since I gave them that name, because of their occurrence in the alluvium along the tidewater creeks. Certainly they are better adapted to such a purpose than the ordinary patterns of jasper points. Throughout southern New Jersey this form is distributed in a way that dissociates them with any one set of physical conditions. I have latterly found them in fair abundance, and so often where no other than argillite objects are found,

that the feeling is one of assurance that they are of an older date than the Indian artifacts. They are all weathered. I have never seen one, among thousands, that had anything like a fresh surface, and some are so far gone that the original shape given to the object by the maker is almost obliterated. Argillite does not decay rapidly, and when one of these slender points is picked from the crumbling sands of an exposure of the "yellow drift," or even from the sur-

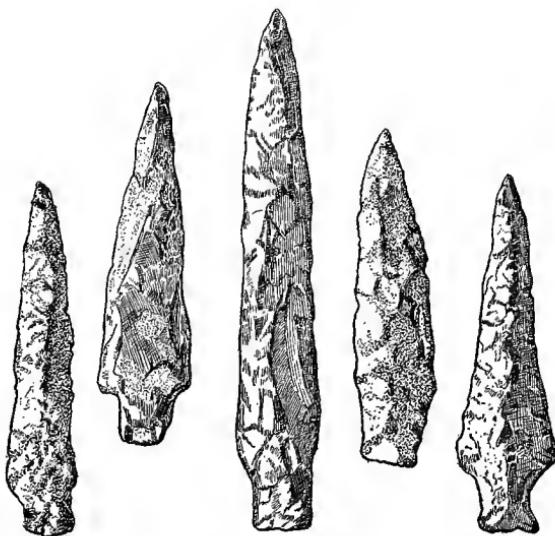


Figure 20.—Argillite points. The culmination of skill in stone clippings of the pre-Lenapèan people.

face, the mind naturally reverts to a distant past, and to say of it, as has been done, that it might have been made when Penn was treating with the Indians at Shackamaxon, is not only absolutely impossible, but the statement was known to be incorrect when made.

One of these implements is so scratched that we can only conceive of such a scar arising from its being at one

time embedded in ice and slowly shoved over a sharp point of flinty rock, or itself held fast in an unyielding matrix, the cutting edge of a splintered stone has passed over it. If this be true, we can only think of a time when local glacial conditions on an humble scale here prevailed. Such conditions prevail to-day on a still humbler scale, when, at the time of writing these lines (February, 1912), there is ice in the Delaware river twenty inches thick, clear as crystal and almost as hard, that might well hold with sufficient grip a broken stone and scar any smooth surface over which it slowly passed. Certainly the present winter, with its unusual ice, affords many an illustration of those major activities, when, in all likelihood, the seasons were more pronounced in their chief characteristics and left indelible traces, where now but little is discernible that marks the passing of the ice.

It matters nothing in this instance, that, in removing the surface soil, the ordinary Indian artifacts were found. Four feet of undisturbed sand between them at once proclaimed the greater antiquity of the one over the other.

The Lenni Lenâpè recognized the value of argillite as a material for certain forms of implements, but this fact no more conflicts with the claim of the one-time existence of a distinctively argillite-chipping man that the continued use of bronze contradicts that we are living in the Iron Age.

In the chapter devoted to the pre-historic river so much has been stated concerning the relation of argillite to silicious stone (jasper and quartz) that we need now but consider the one question of who was this assumed Argillite man, this pre-Lenâpèan, or "Man of the Yellow Drift," as described by Volk.¹

If the only open door at the time to North America was in the extreme Northwest, and man entered while in the paleo-

¹ Arch. Del. Val., p. 84.

lithic stage of "culture"—which I do not unreservedly admit—it is intensely improbable that wandering down the Pacific coast and then crossing the continent and wandering up the Atlantic coast, there should have been no advance in culture, no specialization of artifacts; or, following the first river he came to, tracing its course from its mouth to its source, directly across the northern part of the continent, that man's descendants, betimes the Atlantic coast was reached, would undoubtedly have advanced to a degree that led to the discarding of the paleolithic type of artifact and establishing the use of neolithic patterns.

If North America was peopled from some Asiatic fountain-head of humanity, the time required to even very sparsely populate so vast a territory as North America must have been enormous. We can conceive of man so nearly primitive as concerned only with his immediate wants and not curious about extra-limital regions. So long as those wants were supplied, he would remained a fixed species, much like our box tortoise that outlives a century on the same acre. Migration would only take place as necessity required and certainly with no definite purpose in view. Such uncertainty as to change of base means the lapse of centuries before a continent would be explored.

We know that the Lenni Lenâpè were an advanced people, with well-developed art when they undertook their systematic eastward migration, of which we know something, through a tradition that cannot be lightly set aside. This tradition refers in some detail to the opposition they had to contend with, but all such opposition appears to have been overcome before they reached as far eastward as the Susquehanna and Potomac Rivers. Their troubles appear to have then been over. Had the argillite folk been in the heyday of their glory in the Delaware Valley when the Lenâpè came, would there not have been some reference

to the fact, even if they had been absolutely submissive and their identity lost in the hosts of the invaders. The Walam Olum gives no hint that Scheyichbi (New Jersey) was populated when Lenni Lenâpè came. If not, then this argillite folk had become extinct. It is difficult to come to any other conclusion.

Thirty-two years ago, when "Primitive Industry"¹ was written, I thought otherwise. The transition from the general use of argillite to that of silicious stone seemed demonstrable and the Indian was supposed to have passed from the use of the one material to the other. The result of more thorough examination of evidence on this point, in the last decade, has been to convince me that the association of the argillite man was with a Glacial precursor—the asserted man of the Trenton Gravel—rather than with the Lenâpè, who held their own in the valley of the Delaware until ousted by the Europeans.

It would greatly simplify matters were two distinct conditions of burial found and crania were so associated with jasper and argillite that all that applies to artifacts, applied equally to osseus remains. Unfortunately but few crania are known that are not undeniably Lenâpè, but fragments of crania and some other parts of the human skeleton have been found at various depths in the underlying sands. These, the "professors," without expression of any cogent reason, have relegated to the dust bins of the unimportant, and why? Because not distinctly different in twists and wrinkles from corresponding bones in skeletons of unquestionable Indians. This, of course, simplifies matters through retention of ignorance, which is less onerous than the acquisition of additional facts. Why it is easier to say we do not know than that we do, is to most of us a puzzle, but probably it lightens the labors of the professors.

¹ "Primitive Industry"; Salem, Mass., 1881.

As a matter of fact, no difference need be looked for between older and later bones of pre-historic Americans. Years ago, three crania from the valley of the Delaware were submitted to specialists as possibly not Indian. One was found deep in coarse gravel, and could under no possibility have gotten where found subsequently to the deposition of the containing bed, which dates as far back as the forces that operated to the present arrangement of the sands and gravel in the ancient flood-plain of the river. It was decided¹ to be modern and Lenâpèan. The other two were decided not to be Indian by A. Hrdlicka, and so might be examples of crania of argillite man, but this admission [The Crania of Trenton, New Jersey, and their bearing upon the antiquity of man in that region. By Ales Hrdlicka. Bulletin Amer. Mus. Nat. Hist. XVI, 1902] was recalled later,² and these curious crania were perched upon European shoulders. It is rather significant that at this time and at that place (Washington, D. C.) official archæology did not approve of man's antiquity in the Delaware Valley or elsewhere unless the discovery was made under its auspices. For others to be more fortunate was not within the scope of its plans and the locality, because of others' activities, had been only perfunctorily visited by prejudiced observers, and therefore misrepresented by some and stabbed with reckless statements by others.

These crania and certain fragments of crania and bones reported from time to time are quite as conclusive of man's antiquity as the femur from gravel reported by Volk, which, if so very old, is peculiar in that it is declared to be the handle of a knife. I have had an opportunity of seeing this specimen since its discovery and have grave doubt as to its having ever been put to any such use. If so, would

¹ American Naturalist, Vol. XXXIII, Zab., 1899, p. 143.

² Bulletin, Bureau of American Ethnology, XXXIII, pp. 35-47.

it not argue that its one time possessor was in an advanced stage of neolithic culture? The unrestrained imagination of the osteologists, like uncurbed enthusiasm, wanders sometimes too far a-field for its own good. It would be quite as warrantable to declare the frontal human bone from Columbia Gravel that I discovered years ago was the bowl of a spoon or a drinking cup, because of its water-worn edges and *apparent* evidences of much handling by man. It is, in all such cases, the circumstances of discovery that decided the question of antiquity. If intrusion is shown to have been impracticable and the containing bed has a demonstrable origin and ascertainable geological age, then this must apply to the bones as well as the pebbles found in it. There is certainly no reason why objects as fragile as the tabular bones of human crania should not be a constituent part of a deposit of gravel, even if floods suggestive of destruction are the depositing agencies. It must be remembered that masses of frozen sand and pebbles even now float a long distance and lodging are slowly disintegrated by melting, and without destructive force subsequently operating upon them. I once found an unbroken duck's egg that from its position must have come from some distant point up the river during the freshet incident to the breaking up of the ice at the close of winter. In August, 1891, with Professor Albert Gaudry and M. Boull, of Paris, and the late Thomas Wilson, of Washington, D. C., I visited an extensive exposure of Trenton Gravel, east of Trenton and a mile from the river. Prof. Gaudry remarked upon the absence of molluscan fauna, thinking it strange that I had never found any trace of shell in the sandy strata of the deposit. Three weeks later, I visited the same locality with Mr. Volk, to procure a series of photographic views and in one of the strata of sand found the valve of a freshwater mussel which Mr. Volk photographed before it was

removed. If, therefore, so fragile an object as a shell could escape destruction, there is no reason why human bones should not have remained intact, when brought from some distant point to where they were discovered, ten thousand years or more later.

If it was very necessary to render conclusive the association of man in this region and the closing activities of the glacial conditions once obtaining; that bones should be discovered as well as artifacts *in situ*, then the bones already reported are sufficient to set the matter at rest. To wave them aside because essentially the same as bones of more modern Indians is neither scientific or sensible. If intrusive objects, why then in these gravels which have been searched so persistently for scores of years, have not bones of the horse, ox, sheep and dog been continually exposed? But such is not the case, except where intentional burial occurred, and these disturbances from the surface downward can always be recognized without possibility of being misled. If the bones of the elephant, mastodon, walrus, musk-ox and caribou occur, as has been demonstrated time and again, then the occurrence of human remains, of man living the life very suggestive of the Eskimo, is to be expected. It would be far more strange, did they not occur, than that they do.

The pre-Lenâpèan man then is not a myth. That which we find and refer to him as its originator cannot with equal reason be referred to the historic Indian or his immediate ancestry, but to a precursor, when the Lenâpè "dwelt far to the northeast, on tidewater, probably at Labrador" and later, "journeyed south and west, till they reached a broad water, full of islands and abounding in fish, perhaps the St. Lawrence about the Thousand Isles. They crossed and dwelt for some generations in the pine and hemlock regions of New York, fighting more or less with the Snake

people, and the Talega, agricultural nations, living in stationary villages to the southeast of them, in the area of Ohio and Indiana. * * * The Lenâpè, now settled on the streams in Indiana, wished to remove to the east" and after an undetermined period "they did clear the road and reached the Delaware Valley."¹ Who shall say how many centuries this calls for? Events moved slowly then. We have nothing to guide us in any estimate as to lapse of time. In a sense, we are hopelessly in the dark. "Lost is lost and gone is gone forever," and yet a crumbling bit of stone here and a decaying fragment of bone there, leads the way to the simple fact that man was a witness to events in the Valley of the Delaware of which all knowledge is irrecoverable beyond that of his existence.

There is nothing in the tradition of the Lenâpè that denies the one-time existence here of a pre-Lenâpèan people, and when all that bears upon the question is considered, the probabilities are in favor of such a people. It is not a "most lame and impotent conclusion."

But where did this pre-Lenâpèan come from? That is a problem for others to solve. It has only been my endeavor to demonstrate his one-time occupancy of the Delaware Valley, and this does not make it obligatory on my part to set forth in detail the beginning and end of his career.

¹ Brinton, l. c. p. 165.

CHAPTER IV.

HOMO DELAWARENSIS

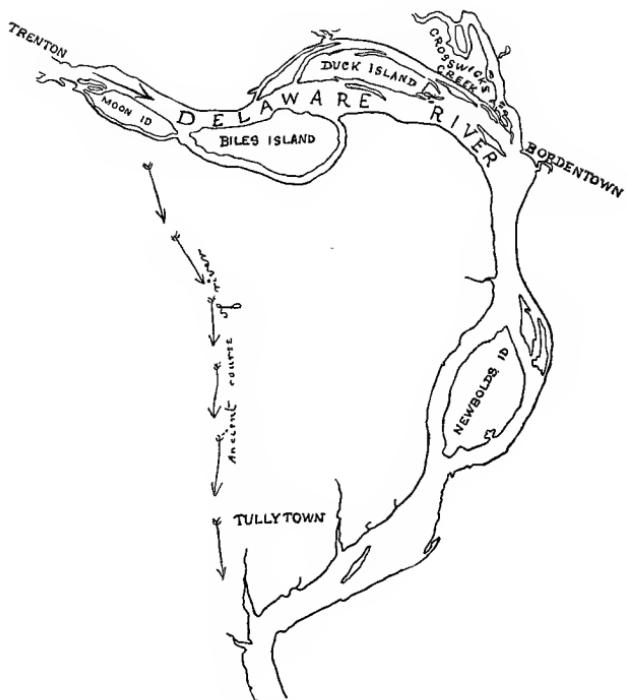


Figure 21.—Map of Delaware River so far as treated of in present volume.

A DAM was wise in this, that he did not endeavor, after he was evicted—so the fable runs—to face the flaming swords that guarded the entrance to Paradise and seek to reinstate himself. Perhaps it would have been wise if I had taken a hint from the story and not again ventured to enter the Valley of the Delaware on a paleolithic quest, hav-

ing been evicted, years ago, by certain learned expositors of archæologic lore.

To be rash is not to be brave, but the weapons of the evictors prove to be, and to have been, more showy than effective, only equal to annoying, but not to placing *hors du combat* any one who sees fit to differ from those who wielded them.

Real courage is shown in attempting to explore the literature of the subject. Not far can one plunge into this jungle before he realizes the hopelessness of progress. No two steps are pointed in the same direction. The "Mystic Maze," known to our popular summer resorts, is simplicity in comparison. All that I have been able to determine, after several such attempts, is that the authors are only positive on the one point, that I, who restored Paleolithic Man to his rightful place in history, *did nothing of the kind*. Why attempt to foist such a myth upon them? they demanded. The myth to me has always been real, and certain broken stones lying exposed on heaps of gravel, restored my earlier courage, or, shall I say, increased my lack of discretion?⁽¹⁾

Those who dwell in this region frequently hear of some project being brought before our legislature to dam the Delaware. So far, this has never reached beyond the initial, wordy stage of suggestion; but those in quest of the river's archæological story have succeeded in damning the Delaware in another sense, and little wonder. Geologists have wandered up and down its valley, posting trespass notices: *Archæologists Keep Off!* This impudent exercise of an assumed right of eminent domain I resented, and have been trespassing on this territory again.

The river still flows to the sea. Its confining shores and

¹ Of course, there were some notable exceptions, and I modestly except my own contributions to a very unnecessary wrangle.

its bed are still paved with pebbles, and monumental boulders are scattered here and there, as if landmarks indicating where incidents of unusual interest have occurred. These must be left to the imagination, but the question, often asked, was there such an ancient man here? can, I maintain, be answered in the affirmative.

We associate man with *terra firma*, but now we are called upon to think of him as a feature of the river more than of the adjoining shores. Not at all, that this particular man was in any sense amphibious, or more so than those savages that are at home in and on the water, as many are, but, having disappeared from off the face of the earth, has left behind him, all unwittingly, traces of his career in and about the river.

It is because these traces, which even the most cautious geologist does not doubt are such, are so intimately associated with the river that they are refused recognition, and he demands instead that the unquestioned reliquiæ of ancient man must be found so far from the river that their one-time owners may never have seen the stream. It is because they are so intimately associated with the river that I hail them as the possessions of this ancient race, to whom I shall refer, henceforth, as *Homo Delawarensis*.

Because an artificially-shaped stone, an implement of some sort, rolls from the river bank to the water's edge, it has been claimed that it has no archaeological significance, but what of a tooth or portion of a tusk of an elephant rolling from the same bank? Are they, too, to be discarded as evidence of this great beast once living in New Jersey, because a pick and shovel did not unearth them, a mile back from running water? Unless the object found in loose gravel, the level spread base of a talus, and along the edge of the stream, bears undeniable evidence of modern origin as pebbles of brick, bits of metal and fragments of articles in com-

mon use, or, objects recognized as the characteristic handiwork of the historic Indian, then they cannot be logically separated from the gravel, of which all evidence points to their being a constituent part, and what, in case of argillite artifacts, is of greatest significance, these have the same time-worn surfaces as the pebbles about them. This fact warrants us in concluding that we have a perfect right to maintain that they have had a similar career and have been brought to where they are found by the same agencies as brought sand, pebbles and boulders, or dropped among them so long ago that they have had time to acquire the same general characteristics of surface.

It has been suggested that they rolled from the surface, or top of the bluff facing the river. This would have some force, if the surface in question was the ordinary soil of the nearest fields, but it is nothing of the sort. The soil was long ago removed. The gravel is as pronounced there as deeper down. It was all removed, with much surface gravel, when the street of a village was graded. If any patches of soil remained, they were long ago washed away. If the surface was the same as when the Lenâpè were in possession, why have not examples of the many forms of Indian handiwork also rolled down this bank and from its base, river-ward, until at the edge of the water? I have never found such, and I have tramped this river shore for fifty years. It is only the one type—the paleolith—and these are rare.¹ Again, it has been suggested that they have, comparatively recently, been washed down stream from the Indian argillite quarries, twenty odd miles away. If so, supposing they came from the nearest argillite outcrop, would they not be fresher of surface and bear some marks

¹The assertion by Holmes that they are common, and not found inland, is incorrect. They are very nearly equally distributed over the area of the gravel.

of their recent rough-and-tumble experience? Would they not bear comparison with those recent up-river specimens, and they do not resemble them. Argillite does not float and more are found at Riverview, high or mid-way on the bluff than at its base. The simple truth is, the river for many years, before the bank was protected, was wearing it away and at brief intervals there was a new exposure and the deposit was spread out in the most favorable manner for closely scrutinizing its contents. The artifacts could not well be overlooked, and their relation to the gravel, as a veritable part of it, is confirmed by the commonplace fact that excavations in the area of the deposit, anywhere back from the river, occasionally brings a typical specimen to light.

It may prove of some interest to briefly sketch, at this point, the history of the examination of this gravel, not only along the river but inland, by others than myself, but whom I accompanied on the occasions mentioned.

Earliest of these visits is that of the late Thomas Belt, author of the "Naturalist in Nicaragua," and a competent observer. It occurred October 4, 1877. While clambering over the loose gravel on the face of the very steep escarpment, Mr. Belt found a typical paleolith in such a position as to preclude the possibility of its having fallen from the surface or near it. The subject, then and there, of such objects being intrusive or later in origin than the gravel as then deposited, was vigorously discussed, I taking the affirmative side of the question, for sake of argument. Mr. Belt insisted, arguing from his own "find" of that afternoon, that it fell to the lot of those who opposed antiquity, to shew how it could be otherwise than a constituent part of the deposit, and it must be admitted, this has not yet been done, although a continuous effort has been made to do so, for the succeeding thirty-five years.

November 18, 1880, Prof. Wm. Boyd Dawkins, the late Henry W. Haines and Prof. Geo. Frederick Wright and myself visited the various exposures of gravel in and near Trenton, N. J., and along the river bank, where, as elsewhere, a search was made for ancient artifacts. Three such specimens were found, and the fact that being in the talus rather than *in situ* did not appear to impair their archæological significance, as these gentlemen then expressed themselves. The inability to declare the original position of the artifacts in the bank did not seriously lessen the value they placed upon the "finds." Prof. Dawkins expressed himself as "convinced" that I had discovered traces of paleolithic man in America, and was the more emphatic when I called his attention to the conditions on the surface, which is wholly the same gravel, dotted over with boulders of large size and which must have brought hither by immense floating rafts of ice.¹

April 16, 1881, Prof. Edward S. Morse and I went over the same ground, and where the Pennsylvania Railroad had made an excavation in the gravel, a mile east of the river, and about one thousand yards long, Prof. Morse found *in situ* a chipped quartzite pebble that was as clearly artificial as an arrow-point. It is needless to add that he was convinced of the occurrence of these disputed paleolithic implements *in* the gravel. Our visit to the river bank was equally fortunate, as I called his attention there to an argillite object in the bank, where the gravel was compact and had never been disturbed. Although such "finds" were nothing new to me, this was memorable because made in the presence of a most competent observer, who was inclined to be exceedingly critical.

¹ It is necessary here to state, in justice to Prof. Dawkins, that he has recently, in a review of Wright's "Ice Age in North America," declared that there is no evidence of glacial man in America. As an instance of paleontological contortion, this is more amusing than important.

September 12, 1884, I again visited the various gravel exposures with Prof. Edward B. Tylor, of Oxford, England, and he found a typical paleolithic implement on an exposed surface and not in any sense, *in situ*. It was lying on the surface of a public road that had been graded down to the lowlands, or present flood-plain of the river. The nearest "surface" of the bluff, still retaining soil and vegetation, was thirty yards distant and twenty feet above the point where the object was found. In other words, the artifact that Dr. Tylor found was twenty feet from the original surface and fifty yards back from the river; conditions which were sufficiently pronounced to be very suggestive of other than recent time, even geologically considered. As a matter of course, as I then suggested, cavilers might claim that the specimen might have been carried here from a distant point and dropped. If so, and how highly improbable, it would have shown some evidence of such an occurrence. Prof. Tylor expressed only pleasure at his success in finding the specimen and took it with him, saying he highly valued it. Any thought that it was intrusive, recent as to its position where found, as, in any sense, other than a paleolithic implement in the common acceptation of that term, did not occur to him.

It is not necessary to go further into such wearisome details. There were other visitors. Professedly skeptical, to a man, and some intentionally blind to the most obvious facts. The result was ever the same. They came, they saw, and the gravel conquered.

It happened, in the minds of some geologists, who were open to conviction, but preferred to be non-committal as to the testimony of the talus at the river shore, that to discover *in situ* artifacts in the gravel at a distance from flowing water was necessary. At that time, most excellent opportunity was afforded by the enormous excavations being

made by the Pennsylvania Railroad, east of Trenton, a mile from the river and reaching to the junction of the Glacial Gravel with the Columbia deposits. Millions of cubic yards of gravel were removed and for years, almost daily, new exposures were made. I paid hundreds of visits to the spot, spending hours at a time, in search of traces of early man. It was very rarely that I was successful, considering the frequency of the visits. The results have been recorded in the various annual reports of the curator of the Peabody Museum of American Archaeology, Cambridge, Mass. Others than these were found in excavations in the city for cellars and later, when extensive sewer trenches were dug in many of the principal thoroughfares. These trenches could not, from their nature, be examined as systematically as was desired. They were too narrow, too deep, and usually the sides were dripping with muddy water that coated the sides of the trench, so as to obscure the real character of every partly-exposed pebble. Furthermore, the texture of the gravel was often so loose that planking was needed as soon as the necessary amount of material had been removed. The most that could be done, or was done—all statements to the contrary, notwithstanding—was to examine the material that extended parallel to the trench and thrown out from it. Naturally, that which capped the ridge came from the bottom of the trench, and under such conditions I found several pieces of artificially chipped argillite. The chances would not be one in ten thousand of their having fallen from the surface, and what if they did? This surface is that of a graded street from which all soil and considerable gravel had been removed. Finally, if these argillite artifacts are "Indian relics," why are they only found? What of the axes, celts, agricultural tools and some spear-heads as massive as a paleolith? These never occur under such circumstances. I had the

hearty coöperation of the contractors who had this excavating in charge and I know that no traces of the Lenâpè were brought to light. I was continually on the ground, and I failed to meet that Richmond in the field who boasted so vehemently of his negative results.

It is opportune, here, to call attention to an expression of opinion concerning the argillite artifacts that I forwarded to the Peabody Museum, thirty-six years ago. It seems to have been overlooked by many who joined in a discussion with a maximum of zeal and minimum of erudition.

Insisting that the Delaware river paleolithic implements spoke effectively of their antiquity, here is what another decides concerning them. I quote Dr. M. E. Wadsworth, as follows:

"Certain of these specimens were placed in my hands in 1876 for examination, their lithological character then being unknown. They were found by macroscopic and microscopic examination to have been made from argillite, greatly indurated, and breaking with a conchoidal fracture. The specimens were weathered to a greater or less extent and showed plainly that the fractures must have been made long ago. This secondary chipping evidently took place long after the original fracturing, but also long ago, as is shown by the weathering of the surfaces of both the primary and secondary fractures. The few secondary fractures are probably natural, and could easily occur if subjected to the action Dr. Abbott supposes. The original chipping could not have taken place by any known natural causes acting upon rocks, so far as the writer has any knowledge. Of course it then brings us to the only agency that could do the work—man. The characters of the specimens, petrographically, bore out the statements made to me by Mr. Putnam, of the conditions under which they were found, whether upon the surface or in the gravels. I

do not see how it is possible that such correspondence of characters could exist unless the specimens were found under the conditions reported.

"The lithological characters then show that the specimens are not natural forms; that being composed of a slow weathering rock, they must have been made long years ago; that many years later they were subject to other conditions, probably natural, by which part have been modified; that since then, they have lain for many, many years exposed to weathering agencies; some showing that they have been subject to this action while lying on or near the surface, and others while buried to some depth.

"Their weathering corresponds to that observed on pebbles of similar composition in gravels elsewhere. It is to be remembered that all the weathering has taken place since the Abbott specimens were originally chipped.

"The term weathering, as here employed, means the alteration and decay that have taken place on the *surface* of the *specimen*, but does not imply that it has been exposed on the *surface* of the *ground*; it may or may not have been; the weathering itself with greater or less clearness shows whether this occurred from surface exposure or not.

"Part of the specimens shown me bore evidence that they had originally been exposed to weathering on the surface of the ground and been covered since, but the covering evidently took place ages ago, if the weathering that they have been subjected to since is any criterion.

"The term 'argillite,' as employed by me, is used to designate all argillaceous rocks, in which the argillaceous material is the predominant characteristic; slate or clay-slate, clay-stone, etc., are simply varieties of it, the term slate being only rightfully used when slaty cleavage is developed. The argillite out of which these specimens were made has no trace of cleavage."

It does not seem that the above leaves anything more to be said. The ebullitions of ignorance in various symposia of which I have heard, but in which I have never joined, are painful reminders of the fact that most is said where least is known. Let certain of our archæologists take up their abode on a gravel bed and honestly swear off from preconceptions and the desirability for learned discussions will vanish, and journals and State geological reports will not have their pages marred by recklessness of assertion that is little short of criminal.

The Delaware river was long since shorn of its nobility. It is essentially commonplace in every detail. There are no majestic falls, frolicsome rapids or wide lake-like expansions, with mythical depths or shores that are legend-laden. It is simply a moderate stream flowing between low hills in as unaffected a manner as the average individual goes in and out unnoticed among the crowds of men.

Were it not, however, in a sense, a sleeping giant and occasionally is roused to real activity, it would have no claim to distinction beyond being the boundary line 'twixt two states. But, given such a phenomenal rainfall as in October, 1903, and its volume proves equal to flooding many feet deep the lowlands along its course and returns to ravines the water that once poured through them on their way to the ancient river.

Again, if during our uncertain winters, there is an unusual accumulation of ice—as in 1892–93—there is also apt to be, in consequence of grounding in the shallows at the junction of tidal and non-tidal flow, a damming of the stream and such serious accumulation of water above the obstruction that ordinarily dry land is inundated until the pent-up waters have strength sufficient to move the barrier, when the river becomes mildly destructive, not so much to its own bounds as to the perishable objects in its reach, as the trees along the water's dge.

What may be claimed to be exceptions to this monotonous round of events, is where, as in 1691, the river is turned from its old bed, by a barrier of ice and finds an outlet in some new direction, and cuts away a slice of its shore and forms an island, as that opposite Trenton; and later or earlier when the series of islands farther down the river were formed; also, in the rapid or gradual destruction of islands, as when a long, narrow nameless one was re-



Figure 22.—Delaware River, ice-bound, March 1, 1893. A return to the glacial conditions familiar to paleolithic man.

duced to a bar, exposed in part only during extremely low stages of the water; and at Perriwig, which sixty years ago was a considerable island, with a growth of heavy timber.

This meant a distribution of coarse gravel over a somewhat wider area, but probably not a pebble of it ever was moved a mile from its former resting place, and if such islands were very, very old, then their destruction means, too, the distribution over the present river bed of any arti-

facts in or on them. What, so far, is the result, in studying the outspread gravels where practical? Rude argillite objects, the artificiality of which no one doubts, have been found, but no trace of pottery of the neolithic or "Indian" forms. But we know that Indians were frequently on these islands and must have left some traces of their sojourn there. What has become of them, I do not presume to say, but the argillite artifacts that were there also and there before the others, are now in the river bed. The floods that swept the surface of the island must have washed them off, and if not carried away, then they would be buried by the later distribution of the body of the island. This would explain why now the older objects are exposed and not the later ones.

These islands, once in the very middle of the present stream and the general features of the river's shores, were in all likelihood more firmly fixed in the days of the Lenâpè, as every few rods had a name, just as, later, the fishermen knew these same shores by quaint or characteristic names. The heavy growth of timber, to the water's edge often, was certainly a protection, and threatening as were freshets, whether with or without ice, the river remained essentially the same, and the up-stream water brought nothing from the hills 'twixt which it flowed except sand and that sorry mixture of indefinable substances which collectively is mud. There has been no transportation of heavy gravel sufficient to make any impression in a down-river direction. The heaviest ice has seldom any adherent sand and less frequently an encased pebble. The cobbles and boulders that are now here came so long ago that definite information is not ascertainable and the Gordian knot of the gravel problem is unceremoniously cut by the off-hand expression, "O, they're glacial."

To those who have a reason for definite information, this is much like asserting the Trenton Gravel consists of frag-

ments of the rocks that are in place elsewhere. Of course the modus operandi of their transformation has been assumed and on the assumption, ex cathedra statements are to be found in journals, technical and others, within reach of the inexpert. All that is necessary, for instance, is to sink South Jersey into the depths of the sea and let the pebbles roll down hill from the mountains above. That is easy. Then, all that is needed is to lift South Jersey up enough to give vegetation a show to breathe, and there you are. Then, we are told of great floods, due to unusual causes, raising the water to such a height, after the coarse gravel was all spread out, that ice rafts, acres wide and many feet thick, were considerate enough to record their passage to the sea by dropping the substantial hint of their transient visit, in the shape of a rock weighing from two to twenty tons. So, it seems, there were giants in those days in the course of terrestrial events, and all that happens now is but a petty reminder of the good old times when things really did happen. Let it go at this. The gravel is here. Floods transported them. There is no other explanation available. But glacial floods or glaciers that build up a moraine are not gravel-makers. Pick up any pebble, unless very soft, and it is evident that the process of wearing off its angles, giving it a surface that is smooth but not polished, shaping it often in accordance with its composition if two or more rocks have been cemented together. All this is in steady progress where the sea, to-day, rolls to and fro the pebble on its beach, and since I have been walking over thousands of tons of gravel dredged from the river and now heaped to form a breakwater, and have seen other acres of pebbles spread over islands and low ground in the course of the efforts to permanently deepen the river, I have come to the conclusion that the lowermost of the so-called Trenton Gravel did not come during the latest glacial condition, from

up the river, but was fragments of rocks converted into pebbles long antecedent to that period. This does not accord, I am told, with orthodox geology, but it has this merit, that in such material matters, as in matters belonging to the world of whim, heterodoxy and true happiness are inseparable.

That some of this gravel was derived from the terminal moraine can scarcely be questioned, but it is that which has every appearance of being the "most recent," as pointed out by geologists, but to the uninitiated there is a suggestion of obscurity in the language used that suggests a distinction where no difference exists.

That from the fateful day when the great ice-sheet began to recede until it was lost in the eternal ice of the arctic circle, there was many a momentous movement and changes on a scale the magnitude of which we can scarcely realize, may well be accepted, but the attempt to restore in a rational way, the sequence of events from then until now, is not a success. There is a moraine sixty miles up the river, and a deposit of gravel down here at tidewater, and perhaps the least said as to the two, the soonest mended. The conditions were favorable and there doubtless was local and occasional distribution of gravel, that in time was gradually brought this whole distance of sixty miles, but be chary of going into details.

All this presents no difficulty to certain archaeological views, provided the depression at the line of juncture of North or South Jersey, or tidal and non-tidal portions of the state, was not so great that no habitable land was in existence. If we separate the two natural divisions of the state and in a deep and narrow depression between them, let this moranic gravel drop, all is well, but, if this could not have been, the weak-kneed archaeologists, as has already happened, rush frantically into the arms of Holmes, exclaiming, "All's Indian."

I am not disposed to do so. South Jersey, I believe, was not the bed of a shallow sea when the Trenton Gravel—*i. e.*, the morainic gravel—was deposited. It had then hills that sheltered a fauna and was capable of sheltering and did shelter man when he discovered it, and that was almost as far back in time.

Time, happily, does not enter into the equation and the last of the gravel reached its resting place in the course of events and then, being no further disturbance of magnitude, the region took on its present aspect and the familiar and methodical processes of Nature were undisturbed.

It was now, not earlier, that *Homo Delawarensis* affected these gravels in a way that has not been provocative of serenity of temper or accuracy of statement, during the past twenty years. That man was elsewhere on the continent before glacial conditions prevailed is established, but this is a question that does not concern us at this time. If man was here, *i. e.*, on the spot, during the deposition of the implement-bearing gravel, there is now no evidence of the fact, but *after* the gravel was in position, then he invaded the territory and his artifacts became mingled with it, not, as I believe, because of floods that rushed down from the mountains, but because of local disturbances of a violence that did not obtain later, when the sand and soil covered the gravel. I maintain this, because there were then and still are streams that could gully, obliterate and reassort this gravel in a manner that renders it plain enough how such artifacts could become deeply embedded. It should be remembered that we are dealing here wholly with unstable material, and the wonder is that it preserves so much of the semblance of permanency. The original condition can only be surmised. We can no more decipher this, seeing how frequent have been debacular disturbances than we can read the original text in the ashes of a book.

Here it is fitting to state, as has been done, time and time before, that if such artifacts as have been designated as "paleolithic" are of Lenâpèan origin, then the local debacle that caused the argillite implement to be buried would have buried also the neolithic implements of a later day. Suffice it to say, this has never been shown to have occurred. As the archæology of the region stands to-day, it is gravel and gravel implements—*Homo Delawarensis*; the later sands and sand implements—Man of the "Yellow Drift"; the surface and surface implements—the historic Indian.

To consider a river as it is to-day and reach to conclusions as to evidence of the antiquity of man in its valley, without duly considering the river as it has been is equal to assuming that the present bears no relation to the past, and this is just what has been done by some visiting geologists, and often while in statuesque pose on the river bank, for some unaccountable reason—at least, they never state it—they exclaim, "Not here, but there!" and point inland. As an archæologist, I humbly submit that the front of a house, facing on the street, has as much and as interesting history as the rear entrance or any lesser structure in the backyard.

Looking at the accompanying map of a few miles of the river's length, from the head of tidewater, flowing seaward, it will be seen that the stream is very crooked. The reason is apparent, when we consider the impassable barrier to a direct course is the high eastern or New Jersey shore. But closer inspection—not of the map, but the locality—shows that the Pennsylvania shore is not a serious hindrance to the water flowing pretty much where it would, so slightly is it above the present level of the stream, and therefore not very long ago, geologically, permanently submerged and now, in part, the flood-plain, for in unusual freshets, the artificial barriers are broken down and con-

siderable areas are covered. If further inspection is made, it will prove possible to trace, at or near the junction of the present gravelly plain and the ancient beach line, some miles inland, a somewhat tortuous depression, presenting the appearance of a dry river-bed. This was at one time the channel of the river. The present one may also have been in existence, but probably not, and even with only the map before us, we can imagine, if not literally "see," that the river, bending abruptly, as indicated by the dotted portion of the map, might become choked with ice and a new channel formed, *i. e.*, the present one; just as in recent years, this present channel has been closed completely and the river sought to re-occupy the ancient one, the low ground on the Pennsylvania side being in places deeply submerged.

The archæological significance of this locality and condition is, that at certain points, rude argillite implements, paleolithic in pattern, occur in limited numbers, and twice there has come to my knowledge, the discovery of a surprising number, gathered within the boundaries of a very limited area, while over the territory indicated as a whole, or that between the river and the one-time stream—Penn's Manor, as locally known—these argillite artifacts are practically wanting, if my own careful search without success is an indication of the actual condition. This is a condition of distribution quite in accordance with the surface-found relics of the Indian. In a given area of a few acres, these occur by the hundreds and I have known thousands to be gathered, and then a much larger area on which they are not found. There does not appear to the collector any reason for this feature of localization, but usually the archaeologist can point one out that is satisfactory to himself if not to the uninstructed relic-hunter. *Homo Delawarensis* or paleolithic man, was a creature much like ourselves in his material aims and had wit enough to choose those sites for

sojourn, temporary or permanent, best fitted to his needs. Usually we can see that the localities where the artifacts occur are such sites by reason of the relation at that point of land and water. This is shown to be where the ground was at the time of occupation, the highest and dryest and margining deep and rapid water, where the chance of securing aquatic life for food was greatest. It is for these reasons that near Tullytown, Bucks County, Pennsylvania, and at Bristol, four miles distant, down the river, where the gravel is and always has been at the surface, if not always actually exposed, that a number of argillite implements of paleolithic pattern have been found and just where, to all appearances *Homo Delawarenses* left them. Soil, it is presumed, gathered about them as the centuries rolled by and a forest protected them; but with the removal of the latter, the soil, too, would disappear and the gravel be again exposed. I can see no reason why this should not occur when we consider the conditions under which European paleolithic implements occur, as in England, for instance.¹ It is for similar reasons that the antiquity of the original paleolithic implements found by me in 1872-76 along the bluff facing the river, near Trenton, and on the gravel where exposed, later, on opposite side of the river, is claimed. The one difficulty to be met is to explain their presence *in* the bluff at such great depths as have been reported. Such occurrence, *in situ*, seems to demand that their presence dates back to the original deposition of the gravel, and so calls for an enormous antiquity; but I have many reasons for believing in the modification of the gravel since deposition. There is evidence, I think, of the mass, as a whole, having been deeply gullied at various points, and so artifacts then on the surface have been inhumed.

¹ Proceedings, Pre-historic Society of East Anglia, Vol. I, 1908-10; W. A. Sturge.

This bluff or riverside termination of the plateau that extends eastward until it reaches an older formation—Columbia Gravel—appears, at one time, and geologically considered, very recently, to have extended across the present stream, sloping gradually to the surface of the islands opposite, as Biles Island and others, half a mile or more away. There is now no evidence that the bluff was cross-sectioned by brooks or considerable creeks, but this must not be held as of much importance, for elsewhere and near by, streams existent in historic time have absolutely disappeared.

As I am now wholly convinced¹ that the “paleolith” is an intrusive object, but intruded when the gravel was but recently laid down and the objects were made and lost by man who saw the river ages before the man of the later sands—Yellow Drift—I can only look upon the burial of many of these implements as due to rains or swollen brooks, crevicing the deposit. This seems the more probable because, as the result of one vast volume of water being checked in its flow parallel to the river, it quickly cut across channel and flowed over the bluff and washed out a deep gully that extended nearly twenty feet into the bank and wide enough to have buried a maker of paleolithic implements, to say nothing of the artifacts themselves, had they been within the reach of this transient flood due to an unusual shower. On the contrary, while none were then inhumed, several were exposed in the sides of the new-born ravine.

Wherever, strictly inland, as running water is now distributed, artifacts have been found in situ, there was still a

¹ At the time of publication of my work, “Primitive Industry,” I considered paleolithic implements as old as the containing bed, but a study of the conditions in Pennsylvania during the past ten years has led me to conclusions reached in these pages, but the implements are, none the less, “paleolithic.”

permanent stream significantly near, as the Assunpink Creek, or else the gravel showed by its arrangement that it had been re-arranged since its original deposition. The Assunpink Creek, now about equally dividing the city of Trenton, was not the only stream that had its course through what is now city territory. North of the Assunpink was Petty's Run, and south of it, a nameless "spring-brook," which was really an underground stream for some distance and had outlet into a meadow-like depression. Its water was celebrated for its purity and its course as open water a favorite spot with the Indians. Now the stream is obliterated. Swollen by rain, melting of snow and ice, it may well have played an important part in displacing the gravel through which and over which it flowed. Is it not a fair inference that when Nature held her own, her forces operated even more effectively than they now do? Nor must it be forgotten that there is no time limitation in all this. How long? is as easily asked as it is impossible to determine.

Another condition that favors my suggestion of cataclysmic gullying, is that the land, as it nears the river, slopes towards it and the rain naturally runs off in that direction. Did not the city guard against such rain-wash, one whole street would disappear. In the days of the Indian, when the region was generally forested, the rain must necessarily have gullied the ground and resulted in pebbles and any artifacts on the surface being buried. Every condition was favorable, but such inhumation, because of the protecting influence of the forest, would be shallow; but prior to the tree growth, or, when an open, gravelly plain, as in the days of *Homo Delawarensis*, the effect of rain-wash would be far greater, and this the more true of sudden thawing of a winter's accumulation of snow. Every condition, it appears to me, was favorable, soon after the deposition of the gravel, for the disappearance from its sur-

face of any artifacts that man left behind him. Certainly most of them were inhumed, for persistent search for them on the surface, where there is nothing but gravel and scant trace of soil, has resulted in finding but four specimens in a shallow cellar excavation, and twice as many more were thrown out from deeper excavations. Here, it may be well to state, boulders thickly dot the surface in every direction.

When the Pennsylvania Railroad was taking away the gravel east of the Trenton station, it removed material that clearly had been affected by a considerable stream running westward and at right angles to the river, as the Assunpink Creek now does, and when this reassorted gravel was removed and the originally deposited or undisturbed gravel was reached, the paleoliths disappeared.¹

Surveying the whole field, not only in New Jersey, but in Pennsylvania, on opposite side of the river, I think no other conclusion can be reached than that the earliest traces of man are all to be associated with the gravel as influenced by streams that operated upon them in such manner as to result in marked displacement and rearrangement since post-glacial floods brought the material to the tidewater region. This, it seems to me, goes far to explain the total lack of general or systematic stratification of the Trenton Gravel as a whole, for no excavation of any significant dimensions will show a continuance of any given stratum of sand or pebbles. Excavations for cellars or other purposes vary in this regard indefinitely and the condition at a given point.

¹ *Homo Delawarensis*, in all probability, had other forms of implements than the carefully-fashioned argillite implements to which I have so frequently referred. One of these is a hammered pebble, its claim to artificial origin being the battered surface. Natural forces may bruise a pebble, but when it is "pecked" and definitely shaped, then the agency of man must be called in. The two forms are very alike, but can be distinguished. This is the art of the archaeologist. The existence of an ancient man does not depend, however, on pebbles, the character of which is open to discussion.

whether stratified or unstratified, with reference to an artifact in situ is not of the slightest importance. The primal force, laying down the gravel direct from some up-river source, did not necessarily exercise a stratifying influence, and a rough and tumble mass of coarse and fine gravel, with a boulder or two, may be older than layers of sand and pebbles arranged with mathematical precision. What is of more interest and importance is the general direction or tilt of layers of flat pebbles. Their position at various exposures show that they were laid down by streams or currents flowing to the river, as well as influence by water flowing in the direction now taken by the non-tidal river; and again, the tilt is sometimes in the opposite direction, or up-river; but I have never found any pebbles that pointed eastward, or away from the river.

Much has happened since the Trenton Gravel was laid down; so much that the date of the initial occurrence is vastly more ancient than has been stated by some whose opinions are entitled to profound respect, and late in the career of this gravel as a great deposit, was the appearance of man. *Homo Delawarensis* is no less a man of the paleolithic stage of culture because in all probability he did not witness any of the major activities of the Glacial period here in the Valley of the Delaware. He did see the country, however, when it bore a far different aspect than now and when probably the climate was as preposterously pluvial as ever in the tropics.

CHAPTER V.

SUMMARY.

NOT YET have all the problems in North American archæology been solved, and the outlook is not promising that they ever will be to the complete satisfaction of every student. The one-time universally accepted impression that our "Indians," ready-made, reached the continent by way of Behring Strait and gradually spread over the country, is so plausible, especially when we consider the superficial resemblance of this race to the Asiatic peoples, that it seemed, in years gone by, to meet every need, and a few paragraphs in school geographies, or as a preface on American history, was all that was required to sum up our knowledge of the subject. That antiquity, such as centers about European or Asiatic populations, was applicable to conditions that obtain here, was held to be preposterous, and indeed, still is by many who have given the subject sincere consideration. Why this should be has never been made clear, and yet the fact remains that the antiquity of man is not popularly looked upon as a feature of the history of this continent. No array of indisputable facts avails, and yet it is as clear as noon-day that however North America was peopled, it must have been so long ago that it is a geological question rather than one purely archæological.

The evidences of man's presence, prior to the colonization of the country by civilized Europeans, point to activities in so many directions, to a succession of cultures, to rise and fall of people long occupying a limited territory, to extensive migrations, to a final scattered peopling of a continent from

ocean to ocean and from the farthest north to the tropics, that such a period must have elapsed that the present reaches back far into pre-historic time.

Whatever the ancient home-land and whenever the date of initial arrival, sufficient time has elapsed to warrant the ethnologist to speak of the American race as he does of those of other continents.

In the preceding pages, I have dealt with a long array of facts and drawn certain conclusions. The former are available to all. For the latter I alone am responsible. What may be the purport of the former or value of the latter, every student must decide for himself.

While summarizing, I propose also to deal with the many views of ancient America that have been expressed, and do so with that freedom that is inseparably connected with matters that are purely speculative. From its very nature, it is evident that the questions which arise are never to be settled beyond controversy. Given sufficient time and Nature wipes out every trace of man's one-time presence. No one can reconstruct a bone from a pinch of dust.

Limiting my researches to a few thousand acres, it may be claimed as presumptuous to go so far as I have done and speak in such confident terms of three distinct horizons, *i. e.*, of an early, an intermediate, and that people whose career practically ended when the European gained control. On the other hand, the conditions obtaining on this limited area could not have become what they are if the area had been forever uninhabited until the arrival of the Lenni Lenâpè. On this assertion, and all that it implies, I took my stand nearly forty years ago and have not budged since and see now, in the light of other discoveries, no reason why I should. Certainly no new-comer in the field; some bent not upon discovery but upon some flimsy reason for protest, has exercised any influence on myself, nor upon others, so

far as I am aware, except among a few who have never visited the spot and were only too ready to accept any counter-statement, however unwarranted, because my discoveries disturbed their preconceived impressions.

What is needed, if it can be given, is another explanation of the conditions I have described and not more questioning that they are real conditions and not accidental occurrences. The latter do not confuse us or wholly deceive us by reason of their mathematical precision. Nature has methods of her own and more is the pity men did not follow them more closely in the matter of consistency.

Too much stress cannot be laid on the importance of field impressions. The artifact, lying where the "vicissitudes of fortune" have finally brought it, means to the observer what no pen yet wielded can make equally impressive. Archæology is the product of the spade—pre-historic archæology in North America is here referred to—and not of the pen, and he who digs a trench and shaves down its sides, inch by inch, finding here a trifle and there some more striking object, knows more at the end of the day than any theorist in library or museum, who wears out his life amid confusing volumes or misleading specimens. The exhibition solely of "attractive pieces," as an exposition of the archæology of any region, is about as monumental an instance of misrepresentation as the perverted ingenuity of the theorist is likely to invent.

That a long-cultivated region, only its surface being examined, can confuse even those who are right-minded in their quest, is not surprising. The commingling of the artifacts characteristic of the three horizons, as in this part of the Valley of the Delaware, must necessarily often have taken place, since the surface has been turned down-side up and up-side down so frequently and many an earth-wound has been deep as well as long. The real cause for

wonder is that opportunity has been afforded occasionally to see the earth intact and so realize that sequence of event which I long ago set forth and which has been temperately opposed by some and maliciously misrepresented by more; but let that pass.

To express the difference in a homely way, the two claimants to archaeological accuracy are those who dig, and those who, rather than face this labor, "dig out." One represents work; the other, words.

The invasion of a continent by civilized man is a very different proposition from the same movement on the part of very nearly primitive humanity. The latter follows precisely the same impulses that influenced such mammalian life as in time reached America from foreign shores, if, as is asserted by the paleontologists, this continent is indebted to other continental areas for certain ancient features of its fauna, for man, in what we may consider as quite or nearly his primitive condition, was less purposeful than those mammals which had completed their evolutionary growth. Man, even those in the paleolithic stage of culture, was yet in an indefinitely formative stage rather than in one we may consider as definitely fixed. He still mumbled and gibbered with brutish delight at each new outlook, much as a child with a new toy, provided food was more readily obtained, when he gorged himself and then curled up, like a kitten, for a nap, after a saucer of milk. Such phases of humanity were explorers of a continent only by accident. It is exceedingly improbable that the soaring eagle, disappearing from sight, ever suggested to them there was a land of promise in the indefinite beyond. Doubtless his eyesight was keen and, of equal importance, his senses of smell and hearing were beyond ours in acuteness, but the animal predominated, and it requires intellectual faculties well advanced to migrate systematically or with a pre-determined or fixed purpose.

The foundation of that wandering propensity, which it ultimately becomes, was the overcrowding of the original home-land, with its diminishing food supply. The large mammals, outnumbering man, felt this sooner than they did, and took the initiative. It is more than probable, therefore, that man followed, not led, certain mammals into America. But, have we sufficient data, that cannot be questioned, to venture into this still debatable province and proceed to populate any country that was not *ab origine* self-populating? The labors of the paleontologist are not yet over and until the pre-human world is set before us in greater detail than at present, will it be safe to be positive.

That North America derived its quota of humanity from Asia or Europe, one or both, is highly probable, but from which we cannot be said to "know," in the sense of knowledge absolute, whatever we may believe. The chasm between actual knowledge and general acceptance has ever been wide and deep. The paleontologist has not yet shown that it is absolutely impossible that this continent—or this and South America—could not have evolved what we call a human type. Such claim has been made and cannot be set aside because of the mere twist of an American monkey's nose. That this continent or South America did so, I do not pretend to claim, but if we are warranted in unqualified assertion on this point, which I still question, are we equally so on that of the precise route by which man entered America from elsewhere?

A valued correspondent writes me: "In a symposium at Washington, on the origin of the American aborigines, every paper favored his migration from northeastern Asia." Very possible, even probable, but when and what manner of man was he? Two very important questions. I do not know what were the expressed or implied opinions of those constituting the symposium, but the general state-

ment suggests a great deal of exceeding interest to the student of the archaeology of the Delaware Valley.

Was the initial migration that of what we may call paleolithic man? This assumes that such men were equal to arduous journeys, not in the sense of having an objective point in view, but equal to removing from a region with which they were familiar to one the nature of which they could know nothing. Such a migratory movement was more likely to have been one per force of circumstances over which they had no control rather than voluntary. In fact, the term "migration" is not a happy one. This means a definite purpose and previous planning and preliminary preparation, readily conceivable of advanced neolithic man, who was one of fixed purposes, but was paleolithic man of mental calibre equal to this? Rather, the spread of primitive man was like that of his mammalian contemporaries of a lower stage of evolution, or, without other purpose than satisfaction of physical needs, as he proceeded.

Assuming then, that, as a paleolithic hunter—perhaps aimless wanderer, man reached North America from northeastern Asia, would he, as such, have spread over the entire continent, without advancing from the paleolithic stage of "culture" to that of a higher grade? To explain the presence of paleolithic artifacts in the valley of the Delaware, he must have done so, and what unnumbered centuries must have elapsed to have covered so vast a territory and why not these imperishable paleoliths found wherever he chanced to be? They are by no means unknown elsewhere, but that man, unchanged, wandered from northeastern Asia to North America by the assumed sole available route and finally, as merely a transplanted Asiatic, dwelt long, as such, in the Delaware Valley, staggers belief. Yet, given the æon required, it perhaps is possible, for geologists measure time without stint. With them, a century is no more than

the tick of a clock. But is it not possible that some other route may have been open to this wandering savage in, of course, pre-glacial time? In 1881,¹ I quoted Mon. Mortillet.² He says of a series of argillite paleolithic collected by myself and forwarded to him: "These stones do not chip so well as those of the somme, because the latter are of *silex*, and silex is easily chipped. On the Delavarde (Delaware) river, there is no silex; men were then obliged to use a different stone—the trap, a sort of volcanic rock, slightly argillaceous, and very hard and difficult to chip. For this the axes * * * are not as perfectly made as those from St. Acheul.

"In many parts of France rocks other than silex are employed and they are no better than (those from Trenton) * * *. M. de Semollè has presented us with axes in quartzite which came from Bretagne, and although our colleague assured us that he had carefully chosen them from many that were not so marked, it is certain that they are chipped rudely enough, because in fact quartzite is exceedingly difficult to break as you wish it. * * *

"It is interesting to see that the same epoch has produced similar industries in such different countries. This makes it more probable, that there was formerly a great bridge between America and Europe. The similarity of a great number of animals and of plants common to the two countries shows the existence of this communication. Still it may be supposed that certain kinds of birds could have crossed the ocean; seeds of plants may have been transported by the wind; but this explanation is insufficient for insects and is altogether inadmissible for terrestrial shells. How can it be imagined that snails and slugs, unable to live

¹ "Primitive Industry," Salem, Mass., 1881, p. 490.

² Bulletin de la Société d'Anthropologie de Paris, Tome Deuxième (III Serie), p. 439. Paris, 1879.

in water, could have passed from one continent to the other if there had been no (means of) communication between the worlds? Perhaps this communication may have taken place in the northern part of the ocean, in the latitude of New Foundland."

Dr. A. H. Keane, treating of this subject, asserts that climate could present no difficulty at the time of man's dispersion (Inter-glacial), and adds: "From the Eastern Hemisphere the New World could at that time be easily reached either from Europe or from Asia."¹

Further citations are not necessary. The subject is in the realm of opinion and until the Atlantic is dry and the Pacific, a continent; it will remain so. Argument falls short of its effort and has done so always, but has never become disheartened. The omniscient geologist is abroad and flaunts suggestion from others than himself. This possibly retards knowledge, but in this instance, it matters not at all, as the charm of our science is the uncertainty of its minor details. The fact that paleolithic man did come to America, if not born here, is unassailable, and so let those who feel an interest in him, be at liberty to wonder concerning his day and generation as they will.

There is really little more that need be said. As I, for one, find the stone implements distributed over the area that I have so exhaustively explored, I find that this distribution is best explained by paleolithic man, or, if possible, a more primitive type, having reached this continent in pre-glacial time—how far back is as yet unascertained and may forever be unascertainable, but this matters not—and that his last stand as such a man was at the border-line of that continuous ice-sheet which geologists assert extended well-nigh across the continent.

¹ "Ethnology," by A. H. Keane, Cambridge, England, 1909, p. 231.

That he followed its retirement northward and the Eskimo of to-day is his representative, we have scant reason for believing, there being no trace of this northward trend of *Homo Delawarensis*. On the other hand, it is demonstrable that this people, so far as they remained here, changing their habits with the changing conditions of the country, were still fabricators of argillite implements, but of specialized forms; the change in fauna doubtless having largely to do with the discarding of their forefathers' paleoliths, and substituting the knife, the spear and arrow-point; if indeed, they were acquainted with the bow.

Then, for causes unknown, possibly this people disappeared and for undetermined ages the land was uninhabited, and so remained until the Lenni Lenâpè first sighted the Valley of the Delaware.

It is now too late to attempt to reconstruct the daily life and current thought of the Lenni Lenâpè when the proud possessors of Scheyichbi, to say nothing of those who went before. Try to reconstruct a sentence from small fragments of letters and if you succeed to your own satisfaction, it means only that your enthusiasm and self-confidence are about equal, and equal only to leading you, it may be, to ultimate confusion.

In Ten Years' Diggings—really four times ten—I have had occasionally what I believe to be a glimpse of what has been, but only a glimpse, and I remember, the while, that if it is possible for a man to blunder when dealing with apparent probabilities, he is prone to do so.

An old man once remarked, "Every day is the anniversary now of some absurdity on my part." The archæologist, at seventy, is too wise, let us hope, to make so honest a confession, but has not some such thought ever passed through his mind?

It is something that soothes the soul, to think that if wrongly interpreted the imperishable relics are still available for others "to try their hand." May they be more successful and think only with pity on the unhappy guesses of those who went before.

APPENDIX.

PEBBLE-TRANSPORTATION IN BROOKS.

I HAPPENED, recently, to notice a little brook that flows over a nearly level bed of small pebbles of nearly uniform size. The water was checked by a board set edgewise, making a fall of about six inches. Beneath this, the pebbles had been pushed out until a pool of ten inches in depth and two feet six inches in diameter had been formed. The displaced pebbles were heaped up, a conical mound, opposite the fall and on the edge of the pool.

An unusual rainfall, about two inches in ten hours, caused the brook to become, for a time, a considerable stream and the on-rush of the water moved the mound of pebbles down stream, bodily, about three feet and somewhat dispersed them. As the waters diminished in bulk, the sand they carried did not fill the basin beneath the fall, but formed a bar a little beyond the accumulated pebbles, and this condition held, unaltered, until a second and greater rainfall removed the sand, and further dispersed the pebbles. One large stone, six inches by eight and approaching a cube in outline, was undermined and tumbled into the pool at the fall. For weeks following, normal conditions have prevailed and the pool is slowly filling up with sand. Were the board removed, no trace of present conditions would remain for half an hour.

I cite these trifling particulars because they appear to me to have a bearing on the generally confused character of the Trenton Gravel. Local disturbances on a scale commensurate with the volume of waters of the ancient creeks flowing into the Delaware might well have re-arranged and

wholly obliterated all traces of the original deposition by floods occurring in the river and due to glacial conditions. If true, then the occurrence of artifacts in this gravel is nothing more than we should expect, and most significant is the fact, that where the greater number occur, *i. e.*, have been found to date, is where the evidence of recent disturbance is the most marked. This, of course, does not modernize them, for if of same origin as the handiwork of the Indians, then every form should be represented in the gravels, and this we know is not the case.

In the early morning of March 29, 1912, there was a heavy rain, lasting for about four hours. The brook crossing the lane was enormously swollen. When I first saw the water, it was turbid, carrying considerable sand, but later was heavily charged with yellow clay and this condition lasted for about two hours, when the water was comparatively clear again. Here we have an explanation of those narrow bands of reddish clay so characteristic of the "yellow drift." A larger stream, like Crow Creek, proportionately swollen, running as it does over exposures of clay, would deposit precisely such thin layers of this material that we now find.

Later in the day, of this date, this stream—*i. e.*, Crow Creek—was swollen to an extent that its banks were overflowed and a portion of the "yellow drift" area, so extensively exploited by Volk and others, was under water, and the water was heavily charged with both clay and sand, as examination proved.

Post-glacial, local, fluvial displacement of the material derived from the moraine before man's appearance upon the scene, explains, too, as nothing else will, the occasional occurrence of a number of artifacts in a comparatively limited area. When a field, fairly evenly studded with Indian relics, is gullied by a violent downpour, and the water is

carried off by a channel of its own digging, it will be found that arrow-points, potsherds and small objects, with the pebbles and modern articles will be gathered from a wide space and collected along and at the mouth of such a channel as I have mentioned. Objects whose known whereabouts were scores of yards distant, have been transported in this way, and what was supposed to have been stolen, found unexpectedly where it seemed impossible it could have reached by any natural means. We all know the disastrous results of a dam breaking away. Long after the Trenton Gravel was originally deposited, for centuries upon centuries, it was subjected to just such local expressions of violence. Dammed for a day, a week or a month, by some obstacle, and then breaking through the barrier, the accumulated water was equal to moving boulders and pebbles and sand, just as the little brook that crosses my lane plays with the pebbles and sand of its winding course; gently when unaffected by rain, and violently as the result of strength gained by prolonged precipitation.

This would explain the hammered quartz nodules reported by Volk in the deep-lying gravels, as well as the well-defined argillite implements which others have been more successful in discovering than has he.

It is incomprehensible to me, that in his years of unremitting field-work, he seems never to have been able to draw from compacted gravel an implement that dispels all doubt as to its age and origin, one with every inch of its superficies artificially produced. I have found many such—"many" in a sense, when we consider that there is not more than one artifact to from five to ten million pebbles. Can it be possible those who oppose them as an article of their faith, have gone before, and converted them into "rejects" or "preliminaries" intended for "trimming sites" which

never materialize? What a desperate effort to conceal the truth?

I recall, however, that one Sunday afternoon (June 27, 1897), as Mr. Volk, G. F. Wright and myself were standing on a broad exposure of gravel near the Assunpink Creek, at Trenton, N. J., Volk picked up a well-defined argillite implement, that was as clearly a constituent part of the gravel here exposed as any one of the large boulders with which it was associated. No one present expressed any doubt as to its paleolithicity. The late Dr. Harrison Allen was present and remarked: "All is plain enough when on the ground, but difficult to realize from hearsay." This, indeed, covers the whole subject. It is one of the phases of Nature, where she rebels when attempt is made to transfer her to a printed page.

IMPLEMENT FROM THE TALUS.

A few words here concerning the one-time talus at the foot of the bluff facing the river, and in 1876-85, almost a mile long. That a talus should be a bugbear is absurd. A cube of gravel conceals 80 per cent. of its contents, and spread out over as great a space as possible and we learn in detail what really constituted the mass. Somewhere in his "Ice Age in North America," Prof. Wright bemoans his ineffectual efforts to find a paleolith *in situ* or in *fresh* talus. I judge from this that talus, if fresh, has a value, archæologically, that a talus, if stale, does not possess. This may be a law, geologically, written on some tablet of stone, but I do not keep such. The more stale the talus, the better I like it. It has a very ancient, if not fish-like smell that accords admirably with archæological pursuits. The paleolith may be one with, yet not one of, the jetsam and floatsam of the river, and why the archæologist should be disconcerted

by an occasional broken tea-cup or a tin can, is to me inexplicable. If he were looking for white pebbles among the black, or spotted pebbles among the uniformly colored ones, the precise position would have no importance, and it is very much the same with the artificially chipped pebbles among those that are waterworn, constituting the gravel deposit as a whole. As Dr. Wadsworth has pointed out, they tell their own story and not leave this to be told by the position wherein they happen to be, when discovered by *infallible* man. The bluff facing the river is gravel from base to capstones, and the latter happen to be a goodly array of ice-borne boulders, some weighing more than a ton. Unquestionably the Lenni Lenâpè were familiar with these rocks, sat on them, walked among them and built fires that were sheltered by them, and may have knocked chips from them for implements, but what has this to do with the paleolithic implements which they did not make, for the excellent reason that for them they had no use. If ten thousand years hence a non-visiting historian, or one that chanced here, pre-determined to ignore the facts, declared that the region was uninhabited and always had been until settled by the English, he would simply be making a fool of himself. Is it possible that in the past anything has happened akin to that which we have imagined of the future? I have seen a penny coined in England in the reign of George II and a penny coined in this country when George Washington was living, found in the same talus and near the water's edge. Shall we deny that one was not older than the other, ignoring the dates plainly stamped upon them? Nature, too, dates her coinage and does not stoop to the use of fictitious figures, and when she marked the paleoliths as prior to the Lenni Lenâpè, she knew what she was doing, and seeking no favor from, entertained no fear of, carping geologists.

The real and sole cause for wonderment is that arrow-points, pottery, pipes, axes, celts and ornaments are not gathered as readily or even more so at the foot of the bluff, as anywhere upland, seeing the fields to the eastward were dotted with villages and wigwams, but in forty years of wandering, with thoughts of the Indian always present, I have never found any trace of these people here at the foot of the bluff. All that was artificial was either very modern or the rude argillite objects that have been the innocent cause of a deal of unnecessary dispute. I have one exception to record. September 20, 1878, I was wandering along the river's edge with the late Prof. J. D. Whitney and Lucien Carr, of Cambridge, Mass., when Prof. Whitney picked up a half of a pestle. Here was a neolithic implement of the most pronounced type and had we passed along there half an hour earlier, one of us might have been hit with it, for it was tossed over the bank, with other rejecta by a woman who was cleaning house. The incident did not lessen the interest shown by Prof. Whitney in a broken paleolith which he found on the bluff, some feet from the base, and which he then said, "from the condition of its surface, never came from the soil capping the deposit." (Note made at time of discovery.) Hand-picked apples are preferred for many reasons, but I do not hesitate to eat such as I find on the ground, and I never imagine they have dropped from the clouds above the tree, rather than from the tree itself.

Mr. Volk records in his archæology of the Delaware Valley, that he took a fragment of a human femur from the gravel, where it was not displaced and the bone clearly a part of the deposit, and later, not far away, lost in sand that had trickled from the escarpment and formed a talus, a fragment of a human parietal bone. This bone was white, chalky, and similar in all particulars of condition to the

bone in place, but if the femur had not been discovered, the parietal in the talus would be only presumptive and not conclusive evidence of antiquity. This is pure and simple rot. The reader will kindly excuse so non-classic an expression, but nothing else so completely fits the case. It is the object itself that tells us that which we desire to know. As Mr. Volk remarks, no white bones drop from a "black" soil that stains everything else a dull red-brown color. This applies equally to a paleolith from the clear gravel, for clean it is at a depth of even three or four feet. All the pebbles are clean. Sand does not render water turbid and the artifact soils nothing with which it is brought in contact, and this does not apply to surface-earth encompassed pebbles.

I have been told repeatedly that while this smacks of probability, it is not "scientific" evidence. I am glad to know it. The evidence of man's antiquity as demonstrated by these paleolithic implements in the talus, is wholly satisfactory to the man of ordinary powers of comprehension, and if not "scientific," the evidence is irrefragable, and what more does the reasonable man want?

It does not appear to have occurred to visiting geologists to study the surface soil and see just what are its chemical as well as physical conditions. Indeed, when I have suggested this, the only response was a semi-audible sniff and that far-away look that perhaps a brother geologist is equal to interpreting but passes the comprehension of the uninitiated.

This soil suffers nothing to lie in it for a few centuries without indelibly staining it. Even white quartz suffers somewhat; quartzite still more so, and sandstone is so brown on its surface that no ordinary scouring will remove it; and again, this same soil has a certain adhesive property and portions of it stick so closely to pebbles and artifacts that only violent rubbing will effect a removal. I have ex-

amined hundreds of relics, years after they were collected, and found thereon traces of the soil which only a stiff brush would remove. I speak thus confidently after forty years' experience, but this appears to be of little value when compared with academic erudition. Possibly, but I have noticed that he who has lived all his life on its coast, knows more of the ocean than the breezy mountaineer or dweller of the prairies, who chances here for a day with all the airs of omniscience.

After the text concerning the origin of the "yellow drift" was completed, it happens that we had a rather unusual rainfall, and as the ground was frozen at the time, the water spread over the surface where the channels of the brooks that conduct an ordinary shower were overflowed. The shallow, nearly obliterated valley of Crow Creek was filled to the brim and several acres of Lalor field, exploited by Volk, were submerged. I found a thin coating of mud, about one-sixteenth of an inch, covering many square rods. Fully nine-tenths of the water came from Columbia Gravel surfaces and added to the deposit, now capped with a vegetation-sustaining soil. The material was in part fine sand, a trace of clay and organic matter. A cubic inch of it, dried, could not be distinguished from a like amount of "yellow drift" taken from some points, and only differed from this "drift" as a whole, in being finer and weighing less, but it must be remembered that in those post-glacial days, there was more rainfall and the country was not so level, and the vanishing Crow Creek was a permanent and a considerable stream. On so much greater a scale, in fact, that the boulders of this "yellow drift" might have been moved by floods of those days, and every one that I have seen is identical with the thousands characteristic of the Columbia Gravel and not resembling those of the Trenton Gravel. When so much is accomplished now with a couple

of inches of rain in twenty-four hours, it is readily seen what must have occurred during torrential downpours many centuries ago.

Under a clear sky and with Nature at rest, the archæologist has little chance to realize what has been and what now are the conditions that make towards constant change. It is with this subject, as with a neighborhood's natural history, an occasional visit is of little worth. A year at least must be given to a small space, and better ten of them, before it is safe to be positive as to botanical or zoölogical features. There are areas in this, my home neighborhood, which I can distinctly remember for more than fifty years. If I had moved then to another country and only returned to-day, I would not recognize these spots, so greatly have they changed. Hills have been leveled and hollows filled, and within twenty years one considerable creek has become more of a marsh than a running stream. The more I wander over these familiar fields, the more I am convinced that the present conditions have been "built up" without any aid from strictly glacial conditions.

Axes and Celts.

With the exception of the arrow-point, known practically to everyone, the grooved-stone axe is *facile princeps* among Indian relics. While ignorance is never so dense as in the highly intelligent community, even the newspaper reporter will not call an axe by some misleading name. Being so common, therefore, as to be universally known, it is strange that it figures not at all in many an account of archæological exploration. I have collected several hundred and have never seen a collection of stone implements, made in New Jersey, wherein they were not generously represented; yet they occur in such a way as not to be clearly associated with

the contents of "pits" or graves and not conspicuous on those so-called "village sites," whereon the other aboriginal artifacts are abundant.

Mr. Volk, in "Archæology of the Delaware Valley," does not mention them as occurring in the trenches which he dug or among the "pit" contents which he gathered during his field-work of over twenty years; yet presumably every Indian had his axe, as, after European contact, he had his iron or brass tomahawk.

In carefully exploiting a selected site, trenching it exhaustively, the implements of the Indian are brought to light so far completely that we can picture the life of the people once here, but the grooved axe is so seldom unearthed that it is not missed; but when we walk without definite purpose over a ploughed field or ground without a growth of weeds or grass, we not seldom find lying on the surface the most characteristic artifact of the Lenni Lenâpè.

Mr. Volk tells me that his impression is that these axes were the latest product of their inventive skill and post-date polished celts; but, even so, their present distribution remains to be accounted for.

We can, or think we can, trace the origin or development of many forms of implements, and can say with some confidence that an accidentally fractured stone suggested the chipped implement, and a water-worn pebble the polished stone implement, but what gave rise to grooving a celt transversely is not demonstrable. If a "sudden thought" on the part of some ancient individual, it certainly "took" promptly, for this form of implement is found over an enormous extent of country. Moorehead ("Stone Age in North America," I, p. 287) asserts that it is as widely distributed as the celt, and that certain types are found at some points not occurring elsewhere. With the exception of the fluted axes of Wisconsin, to which I called attention in 1891, my

own gatherings of these objects will duplicate the forms said to be characteristic of given territory.

So far as New Jersey is concerned, her Indians were at one time a distinctly stone-axe people. I accept Mr. Volk's conclusion that they are a late product of their stone-age industry, but why they are now distributed in a manner so unlike other implements remains a problem to be solved.

The celt presents no such condition as to its surroundings. It is more likely to be found with other articles than without them. Mr. Volk found them in pits which he uncovered. I have done the same, and very recently (March 20, 1912) my attention was called, as I was passing, to two porphyry celts and a little heap of bones of the deer and charcoal, that the plough had brought to light. These celts interested me the more because found within a few rods of the cache of celts of which Figure 7 of the text is one, and near also a larger cache of these implements discovered forty years ago and mentioned by me in Smithsonian Annual Rept., 1876, p. 260. If the Lenâpè, as a whole, were a stone-axe people, they were here, at the falls of the Delaware, distinctly also, a celt-using people, and what is of greater interest, they made these implements larger and of different patterns; the typical form not being the most common.

DISTRIBUTION OF CHIPPED IMPLEMENTS.

It is the common experience of collectors that certain very limited areas afford abundant reward to the patient seeker, and that beyond these well-defined limits, search is well nigh useless. If all that we found was the head of a lost arrow then the needle in a hay-stack is more likely to be discovered, but this is not the case. Where one arrow-point is found we are pretty sure to find another and another, and

with them potsherds, scrapers, knives and drills. We find ourselves on what the collector calls "relic ground," and continue the search with confidence. I have searched in vain certain fields that judged from their surroundings and relation to such desirable conditions as a flowing spring or open water available for canoe navigation and found absolutely no trace of the aborigine, and not far away another field not as advantageously located, judged by present conditions, that was teeming with them. It surprises at first, but should not. We forget what might have been, indeed, must have been, in the days of the ancient man, and prior to the deforesting of the region.

May not this condition as to surface-found relics have a bearing on the occurrence of paleolithic artifacts? Their fabricators were human beings and not radically different from the later Indians, as we carelessly imagine. These rude products of their skill might as readily be localized as are the knives and arrow-points of the Lenni Lenâpè.

CLIMATIC CHANGE SINCE GLACIAL TIME.

There does not appear to be any criteria available upon which to base a reasonable assumption as to the climatic conditions when the Trenton Gravel was laid down, so that we might compare them with those of the present day, of which it can be said that we have degenerated, and, as was said long ago, from the dignity of climatic decency to a sorry array of samples of weather.

That the annual rainfall is not as great as some thousands of years ago is probable, but not demonstrable; but, assuming that there has been gradually a diminution, we have in such fact (?) that the conditions, unstable as they now are, were then in a much more fluctuating condition. If a single summer shower of half an inch can undermine and move

down a gentle declivity a boulder weighing a hundred pounds, as I have known it to do, what of prolonged precipitation amounting to five or six inches? The wonder is that the metes and bounds of sandy farms are not seriously affected. Vegetation is the salvation of many an acre.

It is, however, to snow and frost that I purpose to call more particular attention. The snow that fell during the memorable blizzard of March, 1888, was in many places heaped up to such great height that weeks passed before it had wholly melted away. Trees were in full leaf and flowers blooming, and yet the snow lingered in sheltered spots until about May 20. In one instance that came under my notice this slowly melting snow washed a narrow gully fully four feet deep and nearly twenty yards long. The surface soil and underlying sand were distributed over an alluvial deposit in the adjoining meadow.

Is not so trivial an occurrence as this a straw pointing in the direction of post-glacial cataclysmic action of the same general character, but on an infinitely greater scale?

The presence at the time of glacial activity of arctic animals, musk-ox, reindeer, walrus, and of many seals is not only evidence of more intense and more protracted cold than our modern winters (1911-1912 would have satisfied a reasonable Eskimo), but of more frequent and prolonged storms, and just how gradually the climate became one that attracted life not accustomed to arctic severity, and on the other hand, disgruntled the fauna that now dwells contentedly about the north pole, no one knows or has figured out, theoretically; but it is a fairly safe presumption that the change was gradual, and after the ice melted and the gravel-transporting floods were a matter of history, there were storms of violence that are not now approached. If so, there would scarcely be a stone that was not moved since its down-river journey, nor a boulder, even the largest, that was not tumbled about.

Even if the "ice-age" ended only ten thousand years ago, which I cannot believe, that period is long enough to give full opportunity to effect enormous change and bring the deposits that we now find to their present conditions and relation *inter se*.

It is sequence of event, not centuries by the count, that concerns the prehistoric archæologist, and notwithstanding the vicissitudes of sand, gravel, clay and boulders, it is still possible to trace the three stages of culture of man in the valley of the Delaware, the paleolithic, the intermediate or argillite, and the neolithic Lenni Lenâpè.

THE EFFECTS OF EXCESSIVE RAINFALL.

As I have seen many a dry field temporarily converted into a wet meadow, it occurred to me that rain in post-glacial time might have played a far more important part than has been suspected in changing frequently the surface of the country. The present season—spring of 1912—afforded excellent opportunity for an investigation of this kind. The rainfall to date was several inches in excess of normal, as based on precipitation for the past one hundred and nineteen years. While the country still retains its familiar aspect, there are innumerable minor changes that are not without significance, as, if further advanced, they would become major changes and the effects noticeable by all. Just as the Mississippi river at present has broken the levees that restrained its normal flow, and has flooded thousands of acres, so have what are only narrow, sinuous depressions in fields become the beds of brooks and water has been flowing for, up to date, about fifty days. A measurable amount of sand has been carried from the field to the meadow, and pebbles have "crept" several yards down stream. It is inconceivable that some Indian handi-

work should not have been caught in this miniature flood, and falling from the grass-roots into the depression, reach the horizon of the "yellow drift."

But a far more interesting feature is that of the issuance of water from the face of the bluff facing the river, or temporary springs, which will disappear as the season advances. The underground current must necessarily displace material, perhaps only sand, on its way to the river, and the source of such flow is the surface water covering many acres, temporary ponds and pools from one to three feet in depth. Nothing of themselves now, it is true, but exaggerate them all and prolong their duration and we will see that an object as large as a bone of a man, or of an elk, might be carried underground by a forceful flow of water even if the course was one through coarse gravel, working its way through the cracks and crevices, where the sand and clay had been displaced.

Here in the valley of the Delaware the forces of Nature are feeble to-day. We seldom have a tornado, phenomenal floods are of rare occurrence, but what now happens every day has only to be enacted on a larger scale, as it probably did happen ten thousand years ago, to explain many a condition that we now ascribe to the infinitely fiercer activities of the Glacial Period.

THE UP-RIVER INDIAN.

It may have excited some surprise that in the preceding pages I have made practically no reference to the Indians dwelling in the valley of the Delaware, about the falls, or limit of tidal flow. This was because the territory was not within the bounds of that Lenâpè Land that I have had in mind these many years. It later became a Lenâpè possession, and 'twixt then and the day of irresistible invasion by

the European—a long period—many a village was established and the Lenâpèan arts flourished, as the relics of these people found there testify.

But long prior to that period of occupation the up-river region was one to be explored only and not exploited. It was a region abounding in game and so a source of supply that had better not be too extensively disturbed. It was essentially a hunting ground, and not suited for agricultural purposes without vastly greater preliminary labor than the level, sandy plains near by called for. Again, it was a fighting ground, and the Iroquois, to the north, were all too well disposed to sneak down the stream and capture, if they could, such Lenâpè hunters as they might meet.

If we glance at Rhoads' Faunal Map of Pennsylvania and New Jersey, in his "Mammals of Pa. and N. J." we will find that the biological conditions were the same far upstream as at Trenton and southward, but the physical conditions are as different as possible, and the temperature in winter is often twenty degrees colder. It meant then a good deal more to live among the mountains than upon a forest-sheltered plain, and even after the Europeans were well in possession the "Indians from the hills" came annually in autumn to the pine-grown forests of the plains and gathered along the sea-coast. Many a highway of the present time is, in part, but an expansion of the narrow but well-defined trail of Indians who were high-landers in summer and low-landers when the snow began to fly.

The Lenni Lenâpè in time completely occupied the tidal areas of what is now New Jersey and exploration and subsequent exploitation became imperative, nor was it unwelcome, for an Indian craves adventure more than he does food. A typical Indian day is one chock full of incident. By degrees the villages extended farther and farther upstream, the river being the main highway or water-way to the Lenâpè metropolis at the falls.

It is an interesting feature of humanity that people living on a plain are content to walk upon it and find a living upon it, but do not dig into it deeper than to bury a corpse or plant a few seeds. The idea that *in* the ground is anything of real value seems never to occur to the dweller on the plains, but when among the hills this is all changed. A hill must contain something. It is viewed as a store-house, and the curiosity that is aroused leads to digging among the rocks. This may be aimless at first, but it always leads to a substantial purpose. In this case, the up-river Indian became a miner. Always on the lookout for the best material, the Indian discovered argillite in place, and selecting its finest grade, admirably chipped it into various forms. A word here concerning up-river implements of this material. They are simply somewhat weathered, but compared with those found in the tidewater regions are as fresh as if made yesterday. The importance of this fact should not be overlooked. Max Schraibisch has investigated many rock shelters in northern New Jersey and found the rock-floor had been occupied by Indians who used argillite exclusively, and then upon a layer of ashes, sand and débris, pottery and jasper appear. This shows the material, argillite, was well distributed before jasper and quartz came into general use, but the more interesting feature is that the argillite specimens from rock-shelters are not decomposed to the extent that many are that are found in South Jersey. Protection in the shelter and exposure in the fields of tidal regions may explain this comparative condition to a certain extent, but not materially, and the conclusion reached that argillite was characteristic of a pre-Lenâpèan people is not affected. The exploration in northern New Jersey tends only to substantiate the antiquity of the Lenni Lenâpè, and so push back deeper into the past the period when the Indian's precursor occupied the land.

A most interesting feature of the career of the Indian as a dweller among the hills is his exploitation of jasper quarries, and when he discovered that jasper fresh from the mine was more readily worked than the pebbles of this material occurring sparingly in the river drift, it was used for objects of large size, as those "blades," as they are called, which in South Jersey are so frequently found cached. Careful examination of the mines shows that much selection occurred, and pieces of choice quality were transported, buried in damp earth, and resorted to as necessity required. I have found several such deposits near Trenton, one of which in its entirety is now in the Peabody Museum of Archaeology, Cambridge, Mass.

As a whole, the traces of early man in the Upper Delaware Valley do not suggest an antiquity at all comparable to that of the tidal region immediately southeast of it, but this does not mean that such traces as are found are wanting in archaeological significance. Many discoveries have been made that dates the Indian occupant far back into the past, and the archaeologist need not be at all perturbed by the silly, and in some instances wholly unwarranted, objections raised by Salisbury in his report on the surface geology. The late Charles Laubach's discoveries near Reigelsville, Bucks county, Pennsylvania, were real discoveries of pronounced antiquity, and the fact that water might occasionally reach a height that would overflow it has no bearing whatever on the origin of the deposits overflowed in this instance.

It has been maintained that a complete change of surroundings would effect a change in the handiwork of a people, but this was not brought about in the case of the up-river Lenâpè. I have failed to find any form of implement in this region not common in the tidal region; but, on the other hand, the skill in flint chipping was more uni-

formly excellent near Trenton than at Easton, Belvidere or the Water Gap, three points where the Indians had extensive villages. Comparing a thousand arrow-points from each of the four places named and the difference to which I have referred will be at once apparent.

This, I think, can be explained by the fact that the mountain Indians were of necessity a hunting people, and had less leisure than their agricultural cousins living on the tidal flats and devoted to less onerous pursuits. The latter had time to be meditative, and it is only when not physically occupied that real advance in skill and culture is made. The artistic touch came into being; beauty and use showing in many an artifact.

THE ENCYCLOPÆDIA BRITANNICA AND ANTIQUITY OF MAN IN NORTH AMERICA.

The last (11th) edition of the Encyclopædia Britannica gives the wide range of its readers the assurance that in North America there is no positive evidence of the presence of man prior to the closing of the last glacial epoch. Why, as the glacial conditions were on the wane and not while waxing, or, at least, during the heyday of its activity, is not made plain. Theoretically possible, it is admitted, but no actual demonstration has been brought, not to light, but to the satisfaction of the encyclopædic authors. There is a vast difference herein, for competent American archæologists have, with their own hands, pulled artifacts from compact, deep-lying gravel, which unquestionably dates back to a time when the glacier was still intact in the upper valley of the Delaware and floods, derived from its melting face, pushed gravel to where it now lies, at the limit of the river's tidal flow.

This may be held as an incident of the ice-age's closing days, but was there ever a day when the southern ice-front was not melting and a river flowing from its base? And, too, the river, older than the glacier, was not it filling, in part, a pebbly channel? Why, indeed, may not many a water-worn cobble be older than any glacier, and the same true of many an undeniable artifact? In treating this question, too much has been demanded of the valley by the geologists. They have not treated it as they do when it is a question of what rocks are in place, and what fossils are found in them. There is no more reason to browbeat the zircon that my grandfather discovered in 1825, than the paleoliths that I discovered in 1875. Because a given object refers to man no more modernizes it, necessarily, than a bone or tooth is recent, that rolls from the gravel. The paleontologist is impatient if you modernize his fossils, and well he may be; and the archæologist has just as abundant show of reason of resenting the assertion that because the Lenni Lenâpè were sole possessors of the Delaware valley at no very distant date, all, referrible to man, not having a European origin, is to be referred to them. The physical conditions under which much is found contradicts this scholastic dictum, which impresses the unlearned by reason of its ponderous verbiage.

If, on the other hand, the offered indications of man's presence during glacial conditions be accepted, is it within the realm of probability that during such conditions man originated here? Glacial conditions deal with death, not life, and it is only certain forms of life that find it possible to defy it and maintain themselves. This is particularly true of man. No one imagines that the Eskimo was evolved from an Arctic pithecid creature. He was forced to stay where he is and became acclimated. While just south of the continental ice-sheet there was an abundance

of attractive territory, a veritably goodly land for any reasonable creature, it cannot be assumed that *Homo Americanus* originated here, *i. e.*, was an autochthon. He came from some distant point, and why not before the glacier came into being as readily as during its presence, or in those days when it was slowly disappearing?

Many mineral artifacts are imperishable. A quartz pebble, abraded through use as a hammer, will remain what it is for a million years to come, so why may it not have been used as a hammer a million years ago? Artifacts have a good deal to say for themselves and a sufficient number have been found under conditions, *i. e.*, in such situations, that only an antiquity can be ascribed to them commensurate with glacial antiquity. It is grudgingly admitted that man in North America may have witnessed the closing scene of the glacial drama, but if so, why not present when the curtain rose on that day of ten thousand acts and scenes innumerable? If there is an iota of evidence that man saw the last drops of a melting glacier trickling down the rock-ribbed valley of the river, then there is equal evidence that he saw the beginning of that ice-sheet that extended from Staten Island to the interior west. It is one thing or the other, and I, as a practical archæologist, having studied the problem for almost forty years, stand for that one thing, and would stand with as much faith and as little misgiving as I do, did I stand alone.

Admitting that North America was peopled from abroad, it is not an ascertained fact that this peopling occurred recently and after the country had acquired the physical status that we know was that of the country when the late Colonial period commenced. On the other hand, there is nothing running counter to the view that south of the terminal moraine, man could not have found the country not only practicable but desirable, nor that he did not. For

aught we know to the contrary, South and Central America were inhabited long before the central section of North America, and when the latter was invaded, man may have reached far north of the southern limit of glacial conditions. Had he done so, the invading ice would not only have driven him from the land but destroyed beyond all possibility of recognition every trace of his one-time sojourn there. Furthermore, he might have lingered in just such locations as the valley of the Delaware, while south of him, or along the Gulf coast and in the now arid regions of Arizona and New Mexico, flourished a superior people.

What constitutes evidence? Every individual of ordinary intelligence finds a ready answer to the question, but the reply is one satisfactory to himself but not necessarily so to others. In ordinary matters of everyday life, the question presents no difficulty, but there occasionally arises an extraordinary condition, when decision is a difficult matter and opinions will be so varied that no expression of decision by one individual will meet with universal approbation. A correct solution of an intricate problem can only be reached by a correct attitude towards it and all too frequently those who have been loudest in proclaiming the truth have followed a preconception or been biased by a prejudice. This is true, peculiarly, of ethnologists who have paid painstaking attention to the peopling of North America prior to the Columbian discovery. That which was tangible and unmistakable sufficed them. The "Indian" was a substantial fact and that he had followed in the footsteps of any earlier people was an unthinkable proposition. It was even a geographical problem more than an ethnographical one, and when what is claimed to be geological evidence of antiquity is presented, it is set aside as an instance of an intrusive object, that by some very local cataclysmic action, has caused an object of recent origin to

be inhumed, or, if such artifact by some chance is upon the surface, it cannot be old, but is a "reject" resulting from an Indian's failure to perfect a neolithic implement. The application of such explanation is very soothing to the mind that operates under protest, but knowledge is not advanced in such manner. If the evidence that applies to fossils is accepted as "certain," then the same emphatic term applies to the evidence offered with reference to man's antiquity.

The declaration, to wit:

"Much has been written and more said concerning the existence of man in the United States before the last glacial epoch. The present state of evidence, however, seems to afford no warrant for the conclusion that man existed in the United States before the end of the glacial period. Whatever theoretical reasons there may be for assuming his earlier existence, they must be held as warranting no more than a presumptive conclusion, which up to the present time lacks confirmation by certain evidence," does not honor the monumental publication in which it appears.

It is a curious feature of archæological research that he who bears the heat and burden of the day in the field must have the value of the results obtained passed upon by "experts" who are familiar with objects but not with their history. Not that objects do not and cannot speak for themselves—this they do, but their communicative power is short-lived and dies when the dissociation of object and *nidus* is completely effected. All the museums and all the libraries in the world are not as eloquent of the antiquity of man as a single battered pebble drawn from the face of some compacted, gravelly bluff, and no avalanche of protest avails to influence the message of a broken stone. He who lives by a river's brim needs no tutor to make plain what running water is capable of accomplishing, is daily doing,

and has done in ages past. The river of the theorist may climb the hills, but the practical stream finds its way from the mountains to the sea. The antiquity of man in North America may be a high-sounding phrase and nothing more in encyclopædic pages, but out in the country, under a clear sky, in the searching light of an unclouded sun, where the river flows and field and forest are ready to tell their stories, there even the neglected artifact that frost and fire of centuries have left unscathed, has a tale to unfold that carries him who lends a listening ear, back millennium after millennium until the world as it was, before even the ice age, appears in no uncertain shape. It is not presumption on the part of the archæologist to assert that two and two make four. It is not necessary for the encyclopædist to insist that possibly this may be true. The American archæologist too generally has been afraid of his own shadow. The possibility of making a blunder has paralyzed his efforts. What if he was mistaken once in awhile? The man who never made a mistake never made a discovery.

Marvelous as has been the advance of knowledge in the line of ancient America and her people, we have not yet solved every problem, but, so far as we have gotten, the evidence all points to an antiquity that years ago would have been laughed at, and not one jot or tittle has been discovered that even renders improbable the existence in North America of pre-glacial man.

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